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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Chemical Trade Conditions

In the comprehensive review of chemical trade conditions in 1924, published in this issue, there is one very satisfactory point. Not only at the close of the year are prices steadier, with a tendency to advance in some directions, but a much larger number of contracts have been placed for delivery over the coming year than has been the case at any time since the boom. Overseas buyers are placing contracts for their requirements several months ahead, and some markets which have been taking advantage of depreciated currencies abroad now find it safer and more economical to purchase direct from this country. After studying the position carefully, our correspondent expresses the confident opinion that "the outlook for the trade in general for 1925 is brighter than has been the case for some time." The fundamental fact is that conditions are more stable generally, and from this one may reasonably infer a steadier flow of trade in place of the erratic movements which have troubled business firms so much of late.

As regards overseas trade, two interesting points may be noted. Accounts from Germany all agree that the chemical industry there is very hard at work and bent on recovering lost ground as soon as possible. The financial situation, with the practical disappearance of the old mark, may involve difficult accommodations and reconstructions, but it must be remembered that Germany escaped material damage during the war,

and that the works and plants are still there. The personnel of the German chemical industry, again, has no doubt been depleted, but their excellent educational and training systems will presently make good the loss. The second point is the gradual development of trade with Russia, in spite of the absence of any trade and financial agreement between the two Governments. Recently some quite considerable consignments of chemicals have reached this country from Russia, including caustic soda, ammonium nitrate, potassium carbonate, soda ash, and sodium bicarbonate. The want in Russia of money and of commodities is well known, and if Russian products find a market here British goods must naturally begin to go back into Russia. In that way starting points for a resumption of trade may gradually be found.

Soluble Vat Dyestuffs

THE prominence given in the daily Press of the country, from *The Times* down, to the announcement made in THE CHEMICAL AGE of last week concerning the discovery of a soluble anthraquinone vat dyestuff shows how ready the Press is to do justice to the achievements of chemistry, or of science in general, when information about any new step in advance is made readily available. There are two obvious advantages of such publicity. Not only does a creditable piece of research work secure recognition, but the public are furnished with conclusive evidence that behind the temporary defences of the Dyestuffs Act consolidation and progress are going on which may presently make the industry independent of artificial aids.

This particular advance, one of a series of important steps, as we pointed out last week, has attracted widespread attention in the textile industry, where anything calculated to promote economy or efficiency is of the first importance. Perhaps the most interesting personal statement on the subject is one by Sir William Alexander, made to a representative of the *Morning Post*, in which he welcomes the achievement of Scottish Dyes, Ltd., as a move in the right direction, and refers to similar advances made by the British Dyestuffs Corporation and British Celanese, Ltd. On the general question Sir William Alexander expresses the conviction that we shall not make any great progress in providing new dyestuffs, but that advance will lie rather in the adoption of the methods of colloidal chemistry. This opinion, coming from one who has seen so much of the inside of the industry in the last few years, is distinctly worth noting, and it would be interesting to have the views of dyestuff chemists and dyestuff producers generally on the point. The *Nottingham Guardian*, again, in an informed leading article on the question, uses the occasion to suggest that Nottingham should become a centre of the dyestuff industry. Almost seventy years, it points out, have elapsed since the aniline colours were discovered, and

it can think of no better celebration of the anniversary next year than the establishment of a new dyestuff industry in the city. Nothing could be better for the British dyestuff industry than this widely spread conviction that the industry is really making good.

A Mixed Ammonia-Phosphate Fertiliser

THE account given in our last issue concerning a mixed ammonia-phosphate fertiliser, which has been the subject of investigation by Messrs. Andreasen and Raaschou, of Copenhagen, constitutes interesting reading. It recalls many similar attempts which have been made to secure a nitrogenous phosphatic fertiliser, all calculated to economise the use of sulphuric acid and at the same time to give physical properties not hitherto possessed by chemical manures compounded in the ordinary way.

In *The Gas World* of August, 1923, reference was made to a fertiliser proposed by Mr. E. Lloyd Pease, of Darlington, under the name of "N.P.K." This fertiliser is chiefly of the nitrogenous-phosphatic order, with a little potash in addition. The process contemplates the use of crude phosphoric acid—a vehicle providing essential manurial properties—which has a higher fixation value for ammonia than for sulphuric acid. Sulphate of potash is added in suitable quantity to the crude phosphoric acid, and the resultant solution is incorporated, preferably with peat, so that a damp product is secured. When this acid base is brought into contact with gases containing ammonia, the latter is completely absorbed and combined as di- or tri-ammonium phosphate. The base material emerges from the plant as a dry fertiliser containing all the manurial ingredients required, and in such proportions as may be arranged. Mr. Pease, in his article announcing the new fertiliser, said: "By using the same quantity of sulphuric acid in the Pease process as in the old method . . . there is a saving in acid of 66.6 per cent. If the process is stopped at the di-stage, a saving of 50 per cent. is achieved." Other advantages claimed for the process are no effluents and no steam.

Friendly criticism was offered at the time, and it was suggested that not only were the economics of the process none too sound, but that several of the claims had been placed too high. Indeed, allusion was made to the fact that when coal or coke-oven gas is passed through mono-calcium phosphate, ultimately ammonium sulphate and calcium phosphate are formed, and it was emphasised that the resultant calcium phosphate was citric soluble. This is now confirmed by the Copenhagen research, but the importance of the reaction being conducted at a low temperature and with dried superphosphate is stressed. The other notable feature of the research work, apart from the importance of working with citrate solutions of well-defined hydrogen-ion concentrations, is that a saving of sulphuric acid is foreshadowed. The result of the further fertilising tests which are to be conducted will be awaited with interest. Meanwhile, what occurs to us is this. In the elimination of ammonia from coal or coke-oven gas, is it not better to work with calcium superphosphate rather than with crude phosphoric acid, such as has been proposed by Mr. Pease? It would be interesting to hear what Mr.

Pease has to say on this subject, and also to know from him whether there has been any further progress with the "N.P.K." fertiliser.

Professor Morgan's New Appointment

WE are now authorised officially to announce that the President of the Council has appointed Professor G. T. Morgan, D.Sc., F.R.S., F.I.C., Professor of Chemistry in the University of Birmingham, to be Superintendent of the new Chemical Research Laboratory of the Department of Scientific and Industrial Research at Teddington. While Professor Morgan's departure from Birmingham, where he has done excellent work at the University and been a real friend as well as teacher to his students, will be sincerely regretted in the Midlands, he will be congratulated with equal sincerity on an official appointment which marks a most important new step in chemical research organisation, and which from the present limited beginning may lead to enormously important results. Of Professor Morgan's scientific qualifications for the direction of industrial research there is no need to speak; what may prove, in some aspects, of even greater value is his gift of imagination to see the large possibilities of the appointment, and his sensitiveness to the conditions and needs of the situation.

As to the new research scheme no very precise details are yet available; it may presently occur to the authorities that this new enterprise in industrial research is a matter of some slight public interest. We understand, however, that although located at Teddington the new chemical research laboratory will be a quite separate organisation from the National Physical Laboratory. The new chemical organisation will be under the control of the Department of Scientific and Industrial Research, and will become the headquarters of the various schemes of industrial research which the Department, in conjunction with several trade associations, is already carrying out. Under the new arrangement it is hoped to centralise the direction of the research, if not the actual research work itself, which is now being carried on at independent centres, and the close association with the National Physical Laboratory, with its expert staff and established organisation, will be of great advantage, especially in research in which physical as well as chemical problems are involved. Two important questions which are to receive the fullest attention under the new scheme are the decay of fabrics and the whole question of corrosion. Dr. A. W. Crossley, director of research to the British Cotton Industry Research Association, is, we understand, to be associated with the fabrics department of the new laboratory. The first sections of the new building, the erection of which has been delayed by building difficulties, are expected to be ready for use in six months, but it is hoped that Professor Morgan's advice and supervision will be available before that date.

The Tar Products Industry

ATTENTION was directed to the increasing magnitude of the coal tar industry in our special number a few weeks ago. Unfortunately, space did not permit of a review of all the problems with which the coal tar industry is faced. An examination of the events of

1924 reveals that prices have been very disappointing. Pitch—the main product—has fallen from 78s. per ton in January of last year to about 50s. per ton in December. Similarly, creosote oil opened last year at 10d. per gallon, as contrasted with a current value of about 6½d. per gallon. These reductions are bound to affect adversely the revenue account of the various gas undertakings throughout the country. But "every cloud has a silver lining," and it would appear that the patent fuel industry of South Wales, which has passed through a very difficult period since 1921, now sees signs of renewed life. Already, several of the works which have been out of commission for some considerable time have restarted operations, and it is confidently believed that exports of briquettes will exceed 320,000 tons this year. The continental demand in 1924 was affected in at least two ways. Reparation coal displaced briquettes to an appreciable extent, while the Belgian demand, which hitherto had been a not unimportant one, was almost wholly met with pitch from Belgium's own distilleries.

The quantity of pitch producible in this country depends largely on the demand for road tar. Obviously, the greater the demand for the latter product the less pitch there is available. In 1924 there was keen competition between road tar and bitumastic materials, and it would seem, if tar distillers are to enjoy a market which has developed in a remarkable way in the last few years, that further attention must be given to the quality of their product, and that steps must be taken to remove the water-soluble bodies more effectually than has previously been the case with several makes of road tar now on the market.

The Maximum Penalty

THE maximum penalty of £500, imposed by the Lord Mayor on each of two charges against an importer of synthetic chemicals, named Mavlankar, of making false declarations of value for Customs purposes, may be taken to indicate the very serious view which the authorities take of such offences. There was no real defence to the charges, but two excuses were offered. The first was that, although the responsibility for the practice fell naturally on the principal, the acts were really those of subordinates in charge of a department. The second was that the practice of arranging for goods to be invoiced at prices appreciably less than those actually paid was so common in the trade that the defendant had to adopt it in order to do business. We are not sure how this would appeal to the strict legalist, but the second ground, which implies a deliberate policy, seems to dispose of the other plea that the responsible people were unaware of the practice or, at least, suggests some unusual lack of liaison between principals and subordinates.

That facilities for this sort of evasion of duty may be common is quite possible, but we cannot believe that any considerable proportion of chemical traders yield to the temptation offered them by foreign suppliers. On the contrary, there is a very strong feeling against such practices on the part of reputable firms on the ground both that it is grossly unfair to the individual honest trader and that it tends quite unfairly to bring the whole trade into disrepute. There will be, therefore, among these classes no excessive display of

sympathy, heavy as the penalties in the present case are. It is clear that the Customs authorities—and quite rightly—are determined to put down these evasions of duty, and since the foreign exporter, who puts these seductive proposals in the way of the smaller people, is outside their authority, the full penalty must fall upon those importers who are not strong enough to resist the bait.

Points from Our News Pages

Commercial trade movements in 1924 are reviewed by Mr. W. G. Wilson (p. 24).

Recent chemical publications are reviewed (p. 27).

The Handling and Use of Liquid Chlorine is described on page 28.

An important chemical case, in which the maximum penalty was imposed, is noticed on p. 30.

A lecture on the Life and Work of Dr. Ludwig Mond is reported (p. 31).

Our London chemical market records a recovery after the annual stocktaking and the prospects for 1925 are quite bright (p. 38).

Our Scottish chemical market report reveals the effects of the holiday period, but inquiry, on the whole, has been good (p. 41).

Books Received

CARBONISATION OF COAL IN CONTINUOUS VERTICAL RETORTS. Scientific and Industrial Research, Fuel Research Board. Technical Paper No. 10. Pp. 26. 1s.
REPORT OF THE FOOD INVESTIGATION BOARD FOR THE YEAR 1923. By the Department of Scientific and Industrial Research. London: H.M. Stationery Office. Pp. 96. 3s.

The Calendar

1925 Jan.		
12	Ceramic Society; Proceedings will take the form of a Question Box. 7.30 p.m.	Central School of Science and Technology, Stoke-on-Trent.
13	Institute of Metals (North East Coast Section): "Brazing." A. R. Page. 7.30 p.m.	Armstrong College, Newcastle-on-Tyne.
13	Society of Chemical Industry (Birmingham Section): "The Testing of Resistance to Tearing." H. L. Heathcote. "A Comparative Study of Some Vulcanisation Accelerators." D. F. Twiss and F. Thomas. 7.15 p.m.	University Buildings, Edmund Street, Birmingham.
15	Chemical Society: Ordinary Scientific Meeting. 8 p.m.	Burlington House, Piccadilly, London.
15	Institution of the Rubber Industry (Manchester Section): "History of the Rubber Industry in Manchester." John Adamson.	16, St. Mary's Parsonage, Manchester.
16	Chemical Engineering Group Joint Meeting with The Society of Chemical Industry (London Section): "Low Temperature Carbonisation." 8 p.m.	Royal Society of Arts, John Street, London, W.C.2.
16	Institute of Metals (Swansea Section): "Alloys and Their Properties." Professor C. A. Edwards. 7.15 p.m.	University College, Singleton Park, Swansea.
16	Society of Chemical Industry (Liverpool Section): Hurter Memorial Lecture: "Chemistry and Civilisation." Sir Max Muspratt. 8 p.m.	University, Liverpool.
16	Society of Dyers and Colourists (Manchester Section): "Note on the Dyeing of Acetyl Silk with Certain Insoluble Azo Colours in <i>Statu Nascendi</i> ." Professor E. Knecht.	
17	West Yorkshire Metallurgical Society: Annual Dinner.	George Hotel, Huddersfield.

Chemical Trade Movements in 1924

By W. G. Wilson

In this comprehensive review of prices and conditions during 1924 the features of the market for the principal chemical commodities are described in detail. It will be noticed in the general forecast for the present year that our correspondent, who has recently been investigating conditions on the Continent, confidently expresses the opinion that the outlook for 1925 is brighter than has been the case for some time.

THE position of the Chemical Trade during the year under review has been one of many difficulties, due in the main to the feeling of uncertainty as regards both the future demand and the prospects of the chief consuming industries. Latterly, however, there has been a marked change for the better. Prices have steadied all round, and in some cases have even advanced, while a much larger number of forward contracts have been placed for delivery over the present year than has been the case at any time since the boom.

Trade in the early part of the year was very quiet and little activity was experienced for several months, although at the same time prices remained relatively steady. During the months of May, June, and early July the market was, if anything, quieter than ever, but towards the end of July an improvement set in and the demand commenced to expand. Even with the incidence of the holiday season, this improvement was maintained, while during the closing weeks of the year business has broadened in many directions.

The trade in Heavy Chemical products can be said to have been, with one or two exceptions, relatively satisfactory. English makers continue to hold their position, and even in some cases have regained lost markets, and it is very gratifying to note that in most cases Continental competition can now be satisfactorily dealt with.

The serious competition experienced in previous years by reason of depreciated Continental exchanges has been nothing like so severe as in the last few years, and the stabilising of the German mark has had the effect of causing advances in prices in that country.

The Fine Chemical Industry has been only moderately satis-

factory, but this, perhaps, might be ascribed largely to the small volume of export trade, a condition of affairs which may be confidently expected to improve in the near future. The many fine chemicals manufactured in England can now be freely sold in competition with the world's markets.

In regard to export trade, this has been uncertain, and until the closing months of the year has been for relatively small quantities and for quick delivery. Latterly, however, the demand has distinctly improved, and many discerning buyers Overseas are now placing their contracts for their requirements several months ahead, which alone is a most satisfactory sign. Furthermore, some markets that have been in the habit of taking advantage of depreciated exchanges now find that it is safer and more economical to purchase direct from this country, and it is hoped and expected that this movement will be accelerated.

After studying the position carefully I am confidently of the opinion that the outlook for the trade in general for 1925 is brighter than has been the case for some time, and the mere fact that values to-day, on the whole, seem to be now more or less stabilised will give consumers the necessary confidence.

It must, furthermore, not be forgotten that quite a number of producers, under stress of competition, have been selling at below an economic figure, and that advances must be expected in prices with any distinct broadening in the volume of business.

The operation of the Safeguarding of Industries Act has been improved, and one does not hear many complaints nowadays of delays on the part of Customs authorities.

ACETONE has been, on the whole, somewhat disappointing. In January the product was firm at £120 per ton and continued at that figure until the end of the month, when the price fell, owing to lack of demand, to £112 per ton. This easier tone continued, and by easy stages the price receded up to June, when it stood at from £98 to £100 per ton. In July the price firmed up again to £105, but thereafter it has steadily declined, until it stands to-day at round about £80 per ton, and is fairly easy at even this figure. A feature of the year has been the very poor demand, several of the largest consumers taking much less than their anticipated requirements.

ACIDS.—Business generally has been of moderate dimensions, and fluctuations have not been as large as might have been expected.

Acetic.—The market at the commencement of the year was very firm at £47 per ton for 80 per cent. technical, and in February further hardened to about £49 per ton. This figure was maintained until April, when the price declined to £46, at which figure it continued more or less steady until July, when it eased to £43 per ton with other strengths in proportion. From that date there has been a small decline in value, and we close the year with the product fairly steady at £42 per ton. Taking the year as a whole, business has not been as active as it might have been, and the hope is expressed that the early part of this year will see a considerable broadening in the demand.

Citric.—This again has been an unsatisfactory market with little of interest to report. At the commencement of the year the product stood at 1s. 5½d. per lb. and thereafter slightly advanced until in June it was quoted at 1s. 6½d. per lb. Thereafter it commenced slowly to decline, and at the close of the year was an easy and neglected market at 1s. 3½d. per lb., with little prospect of an early advancement.

Formic has been rather a disappointing market. In January it was very firm at £65 per ton for 85 per cent., and thereafter it advanced to £70 per ton in February. In April, however, the market sharply declined to £65 per ton, and from that date steadily continued to fall until June, when it was quoted at £55 per ton. No further recovery is to be reported, and we close the year with the material in steady demand at £52. The consumption, on the whole, has been below normal.

Lactic.—This product has been more or less stationary in price throughout the year. Although during the first few months the demand left a great deal to be desired, yet latterly this has sensibly

improved, while at the same time the price has registered a slight fall. The average figure throughout the year has been round about £41 10s. per ton for the 50 per cent. by weight material, and it is reported that a substantial volume of trade has been fixed for next year.

Oxalic.—Here, again, the demand has fallen below expectations. In January it was quoted at 5½d. per lb., and this figure by June had declined to 4½d. per lb. It has further fallen slightly until, at the close of the year, supplies can be obtained at 4d. per lb. for the imported article. At the latter figure, however, the market has sensibly steadied, and some substantial contracts have been laid down for the early part of this year on this basis. Business practically throughout the year has been of the hand-to-mouth variety.

Salicylic.—This has not been such a fluctuating market. In January B.P. was quoted at 2s. 5d., with a fair demand, and thereafter declined steadily until in June supplies could readily be obtained at 1s. 9d. per lb. It is now steady at 1s. 6d. per lb., and considering the continuous decline the demand has been relatively satisfactory.

Tartaric.—This article has only been in moderate request, and business generally has been disappointing. In January it was quoted at 1s. 2d. per lb., less the usual 5 per cent., and has continued more or less stationary at this figure. We close the business with the market barely steady at 1s. 0½d. per lb. This price could be shaded for large quantities, and an early improvement in the price may not be impossible.

ALUM has been steady, generally speaking, throughout the year. With a starting value of about £11 10s. per ton, it is quoted to-day at from £10 to £10 10s. per ton for lump ammonia. British manufacturers have been able successfully to meet the competition, except in isolated cases, for potash material.

ALUMINA SULPHATE.—Competition in this product has been exceedingly keen, and Continental producers have made a great fight to secure a share of the trade, with the result that the price has declined to a figure which is described as below the present economic value. 17/18 per cent. was quoted at the commencement of the year at £9 per ton, and thereafter steadily declined until in June supplies could be obtained at £7 per ton. Competition continues, and we close with the market barely steady at £6 10s. per ton, with 14/15 per cent. in proportion.

AMMONIUM SALTS.—Trade, generally speaking, has been satisfactory, and British makers have been able in most cases to

hold their own with Continental competitors. Most products have firmed up in price of late, and the outlook is healthy.

Carbonate has generally been in fair request, and the Continental competition has not been so severe as was the case last year. In January the market stood at 3d. to 3½d. per lb., but in February there was an advance, and thereafter the market held firm at £37 to £39 per ton.

Chloride.—The market opened extremely firm in January at £29 per ton for the fine white crystals, and this figure was maintained until April, when it started to decline, until in September supplies could easily be obtained at £26 per ton. This figure was maintained until the end of the year, when a comparatively satisfactory business can be reported.

Phosphate.—This product has been practically stationary in price throughout the year, and the English makers have been well able to meet foreign competition; in fact, the imports have been negligible. The average market price is round about £52 per ton.

ARSENIC has been generally unsatisfactory during the year, in the main due to the lack of export demand, America in particular being practically out of the market during nearly the entire period under review. In January it was quoted at £67 per ton for Cornish 99/100 per cent., from which figure it declined to £60 per ton by the end of April, and by July supplies could easily be obtained at £50 per ton. The decline has continued, and as we close the market is much steadier at from £37 to £40 per ton, with more inquiry in evidence.

BARIUM SALTS.—Trade in these salts has been satisfactory.

Chloride.—This salt has been well called for throughout the year and has met with only slight fluctuations. The average value during the year has been about £14 per ton, and at this figure the market closes steady with a brisk demand.

Nitrate.—The demand, again, for this product has been poor, and the majority of business has been taken by Continental producers. In January the quotation was £35 per ton, and it continued fairly steady at this figure until the closing weeks of the year, when there was a slight advance. The value may be taken to-day at round about £37 per ton, with a firmer tendency. The inquiry in the latter weeks of the year considerably improved.

BLEACHING POWDER.—Trade in this article has been much more healthy and English makers have been able to hold their own with foreign competition, while it has been possible to keep the price steady. The average value throughout the year was £10 per ton, and a reduction has been made for next year of 10s. per ton for contract quantities. At this figure English makers report satisfactory business.

COPPER SULPHATE.—This market was more active during the year, although German and Belgian competition continued very much in evidence. Continental values are now firming up, however, and British makers appear to be securing a fairer share of the business than hitherto. Values have not fluctuated a great deal, and from an opening value in January of £25 per ton the market has slowly declined to the present value of £23 per ton, at which figure there are plenty of buyers. An advance in price is not at all unlikely.

CREAM OF TARTAR.—This article has been in poor request throughout the year, and the price level continues exceedingly low. It would appear that for certain purposes the use of the article is declining. In January the value was £83 per ton, and in March there was a slight advance to £85 per ton. This movement continued until June, when a further small advance was registered. Subsequently, however, there was a decline, and we close with an easy market at £81 per ton, at which figure the product most certainly cannot be said to be overvalued.

EPSOM SALTS has been in satisfactory demand throughout the year, and British makers have supplied practically the whole of buyers' requirements, very little German material having arrived in the country. Price has been relatively very steady, and the value for technical has been practically standing throughout the year at £5 per ton. Export demand, however, has not been as active as could be desired.

FORMALDEHYDE.—The market for this product has been depressing in the extreme, while the demand has left a great deal to be desired. At the commencement of the year the market was barely firm at £65 per ton, and by May it had declined to £58 per ton. The decline continued steadily until, in September, it had reached £51 per ton. We close with a very weak market at £45, and even at this low figure business is far to find, and before an improvement sets in a further decline is not improbable.

IRON SULPHATE has met with a steady demand both on home trade and on export account. Price has been steady, and the average value is round about £2 10s. to £3 per ton in barrels.

LEAD SALTS have been quite active, with a brisk demand over the greater part of the year with a fairly steady price.

Acetate.—This product has been mainly supplied by Germany, and throughout the year the demand has been active, with price relatively steady. During the opening months of the year the material was firm and stood at £44 per ton, but in October it commenced to advance under the influence of the increased value

of the metal, and we close with a very strong market at £47 10s. for white and about £2 per ton less for brown.

Nitrate.—Business has been of moderate dimensions, but the price has kept remarkably steady. The average value throughout the year has been about £41 to £43 per ton, and at present the demand is improving.

LITHOPONE.—The demand for this material has been quite healthy, and price movements have been within narrow limits. From an opening value of round about £21 per ton for standard 30 per cent. quality the market has slowly declined, and to-day supplies can be readily obtained at £19 10s. per ton, at which figure there is no great pressure to sell.

POTASSIUM SALTS.—The demand for these salts has been rather better this year, and in the latter months prices have been much firmer with an upward tendency.

Bichromate.—Consumption of this product has been more normal and the price has been very steady. For the first months of the year the British makers' price was 5½d. per lb., less 5 per cent. In July this was reduced to 5½d., which figure was maintained until the end of the year, when the makers announced a further reduction to 5d. per lb. for this year's contracts.

Carbonate.—Trade in this article has been very small, comparatively speaking, during the year and there has been little variation in value. From an opening figure of £27 per ton on the basis of 80 per cent. the price has slowly declined and is to-day extremely firm at £22 per ton on the basis of 80 per cent.

Caustic.—The demand for this article has somewhat improved. Starting the year at a price of £32 per ton this figure was maintained until May, when the market commenced to decline, and was then quoted at £30 per ton. It has practically remained at that figure ever since. Supplies can be obtained to-day at round about £29 per ton for spot deliveries.

Chloride has been a very uninteresting product, and the figure has ranged round about £9 10s. per ton throughout the year.

Permanganate.—Business in this article has been in the main satisfactory, and the price has been without violent fluctuations. In January supplies could be obtained at 9½d. per lb., declining in March to 9d. per lb. This decline continued steadily until September, when the material could easily be obtained at 6½d. per lb. Thereafter, an improvement set in, and the market is now firm with an active demand at 7½d. per lb.

Prussiate.—Trade in the early months of the year was very poor, but latterly demand has increased considerably, and as we close there is a tendency for the product to become scarce. Opening in January, the material was quoted at 9d. per lb., at which figure it remained steady until June, when there was a sharp fall to 8d. per lb. The market continued to decline until October, and supplies could then be obtained at 6½d. per lb. An improvement in the demand then set in and the market continued to rise. We close with the material in good demand, with the price at 7½d. per lb. with a rising tendency.

SODIUM PRODUCTS have been pretty steady in value throughout the year, with one or two exceptions, and in the main heavy chemical producers in this country have been well able to cope with foreign competition.

Acetate has varied little in value, although, on the balance, price has declined. At the commencement of the year it was quoted at £24 per ton and maintained this value for the major part of the year. It then declined, and is to-day standing steady at £22 per ton, with only a limited demand. Continental material has, in the main, supplied the needs of this market.

Bicarbonate has been very steady, and the price for mineral water quality is £10 10s. per ton.

Bichromate.—This material has not been disturbed so much by foreign competition. A certain amount of Russian and American material has been imported, but the British makers have been easily able to face this competition, and, in addition, to increase their export trade. At the commencement of the year the quotation was 4½d. per lb., less 5 per cent. for contracts, and this figure was reduced to 4½d. per lb. in July, while for this year the quotation is 4d. per lb. and substantial business has been fixed on this basis.

Bisulphite.—The demand during the year has been quite satisfactory, but fierce competition has prevailed both amongst the home trade makers and on the part of continental producers. At the commencement of the year it was quoted at £18 10s. per ton. It has declined since by slow stages, and is now obtainable at round about £17 per ton, at which figure the market is relatively steady.

Chlorate.—Only a very moderate demand has been experienced, although at the same time there has been little variation in value. To-day supplies can be obtained at round about 2½d. per lb.

Caustic has met with a brisk demand, both on home trade and on export account. For home trade the opening value for 70/72 per cent. material was £17 17s. 6d. per ton, and the market was maintained at about this level.

Hyposulphite.—British makers have experienced quite a satisfactory demand and have not been greatly troubled with continental competition, except in one or two isolated cases. In January the commercial was quoted at £10 10s. per ton, and to-day bulk supplies can be obtained at an average of £9 5s. per ton. In

regard to photographic quality, trade has been good, and the average value is between £14 10s. and £15 per ton.

Nitrite.—The demand for this product has left a good deal to be desired, and the whole of the year registers a decline. From an opening value of £29 per ton the market has declined by successive degrees, until to-day supplies can be readily obtained at from £23 10s. to £24 per ton, according to the quantity and position.

Phosphate.—Trade has been much more brisk in this article, while values have remained fairly steady. In the early part of the year supplies could be obtained at £14 10s. per ton, and during the year it has slowly declined to the present value of £13 per ton, with not too much material offering at this figure.

Prussiate.—During practically the whole of the year this was a very unsatisfactory market, in the main due to the lack of export demand and to fierce competition on the part of foreign producers. In January the quotation was 5½d. per lb. From this figure it had declined by June to 4½d. per lb., and in October the material could very readily be obtained at 3½d. per lb. The position then improved and the demand increased, and it is understood that a large quantity of accumulated stocks has now found its way into consumption. The market closes with an upward tendency at 4½d. per lb.

Sulphide.—The demand has been very active during the year and

a satisfactory feature has been the increase in the volume of export trade, while the quotations for foreign material now practically approximate that of the home product. During the year the market has eased from the opening figure of £17 10s. per ton to the present value of £15 per ton for the concentrated and from £10 10s. to £9 5s. per ton for crystals. There is little likelihood of a further decline in the near future.

Sulphite.—Trade has only been moderate, while the value has varied very little. The quotation to-day may be taken at from £10 10s. to £11 per ton for commercial and £15 to £16 per ton for photographic.

TIN SALTS have fluctuated fairly considerably during the year, in sympathy with the metal, but despite this quite a substantial amount of business has been transacted.

ZINC CHLORIDE has been moderately active, with no violent fluctuations. To-day's value is £18 per ton for the liquid and about £25 to £26 per ton for the solid.

ZINC SULPHATE.—Some good business has been in evidence for this product, while the price has revolved within narrow limits. From an opening value of £15 per ton it has declined slowly to the present value of £13 10s. to £14 per ton.

Reviews

MODERN CEREAL CHEMISTRY. By D. W. Kent-Jones. Liverpool: The Northern Publishing Co., Ltd. Pp. 324.

This work shows some of the advances which pure chemistry has made in recent years and their application to flour milling and bread-making. The volume has been wrongly named, for it deals not with cereals in general but with one member of the family only. It is a pity that the author did not take a wider sweep of this fascinating branch of chemistry because the behaviour of rye, barley, oats, rice and maize throws light on that of wheat, and its products. Most important work, for example, has been done on the malting of barley which has a direct bearing on the conditioning of wheat.

However, except for essays published here and there in book or journal, this is the first attempt since Jago gave us his monumental work, to cover the whole field of the chemistry of the wheat berry. It is very different from its predecessor because the author has applied all the modern weapons of colloidal state and hydrogen-ion content to approach nearer to a solution of the baffling problems with which this field is characterised. The old riddle of "strength" and the latest one of "conditioning" are opened up still more by the use of these new view points. It seems already a far cry to gluten and gliadin ratios. It is clear that cereal chemistry will soon be sorted out into more definite problems which will in due time be solved by painstaking effort.

Vitamins, of course, had to be mentioned. They are as topical to-day as enzymes were yesterday. The author sanely points out a fact which is often overlooked, viz., that white flour, said to be deficient in water soluble-B, is not eaten raw but is made into bread with yeast, a substance very rich in this B—Vitamin. One of the most recent medical encyclopædias completely misses this point.

The volume is rather uneven. Colloidal considerations and hydrogen ion concentration are dealt with at great length and conditioning and fermentation too lightly. The former is the big problem of the miller to-day. He is intrigued by the alleged chemical and physical changes which washed wheat undergoes as it passes through a conditioner with its heaters and air currents. Some say that the nature of the wheat is fundamentally altered, while others smile at this new fashion. Accurate knowledge and reliable data are the industry's crying need.

In a book in which the author confesses, in his preface, may show signs of "hurried preparation," one would expect to find inaccuracies. They are singularly few. Its fault is, as already pointed out, unevenness rather than lack of care, though the milling section might have been revised more thoroughly and such loose statements as the following on page 178 might have been weeded out:—"By the use of improvers, it is possible to utilise better the weak native English wheats. This, combined with the fact that by the use of an improver an increased yield of bread is available (because of increased water absorption) means in the end, advantage to the public." A questionable advantage to the public to pay bread price for water, even if it means better business for the farmer!

Notwithstanding, we welcome the book for one effect alone.

It will, in time, stray into University libraries and may attract our professors and research students to this immense unworked field. Let them research by all means, on the pure chemistry problems in this branch. We shall soon find the application. To-day, we are almost entirely dependent on America for this knowledge. Finally, let every miller and baker and operative who thinks, buy this book and study its contents. T.

CHEMISTRY AND ATOMIC STRUCTURE. By J. D. Main Smith. London: Ernest Benn, Ltd. Pp. 222. 12s. 6d.

The astounding advances in our knowledge of the structure of matter which have continued with amazing regularity since 1895, when Röntgen published his discovery of X rays, and 1896, when Becquerel announced the radio-activity of uranium, have excited the admiration and interest of all scientific students. The story of these advances has been told by numerous writers during the past few years. Nevertheless there persistently arises in the mind of the chemist the pertinent inquiry: "In how far do these new experimental facts and theories conduce to a deeper appreciation of the distinctive characteristics and complex reactions of the individual elements?" The answer to this question is found in the new book by Dr. Main Smith on *Chemistry and Atomic Structure*. This writer has rightly held that the chemist who wishes to have an adequate appreciation of recent discoveries must have a clear conception of the fundamentals of his science. The first part of the book is concerned, therefore, with such subjects as equivalent, atomic and molecular weights, the early ideas on valency, electro-chemistry and the classification of the elements from the standpoint of Mendeléeff and Lothar Meyer. Following this introductory and important matter is a chapter on Werner's Co-ordination Theory—one of the outstanding merits of this book. It is to Alfred Werner that the author dedicates his volume, and he explains in a lucid manner the main principles of this essentially chemical theory. Werner's theory, first enunciated in 1891 and elaborated in 1893, immediately correlated and clarified a vast range of obscure phenomena. The investigations by which Werner established the octahedral configuration for compounds involving six units associated round a central metallic atom, first by showing the presence of stereo-isomerism and later the irrefutable evidence of optical activity, will always rank as one of the masterpieces of our science.

This fascinating chapter is followed by a survey of our knowledge of radioactivity leading logically to the theories of the structure of the atom. The Bohr Sommerfeld theory is exhaustively and critically considered whilst the relativity effect on mass is added as an appendix. This book arrives at an opportune time when the relationship between Werner's theory and the Bohr theory is being actively discussed. Such a volume is, therefore, of immense value to those who wish to keep in touch with these developments, and it can be unreservedly recommended as an attractive and stimulating treatment of a subject of great importance to every chemist. The book is well printed and illustrated by numerous clear and helpful diagrams. W. W.

ELEMENTARY QUALITATIVE ANALYSIS. By J. H. Reedy. London and New York: McGraw-Hill Book Co., Inc. 1924. Pp. 137. 7s. 6d.

In the preface it is stated that this book is an attempt to put in printed form the system of laboratory and quiz room instruction that has been developed in the elementary courses in qualitative analysis at the University of Illinois. It is also said that students should be given to understand that they will be held accountable for the notes on all the procedures assigned by the instructor, and that the instructor should not fail to quiz them constantly on these discussions. Evidently the word "quiz" is not here used in the usual English sense. The words sulfur, sulfide, sulfate and odor have an unfamiliar appearance to English eyes but can readily be translated.

The arrangement of the book is very similar to that commonly adopted in English books on the same subject. Part I deals with the detection of the ions of the metals, and Part II with the detection of anions. Part III gives some instructions for the systematic examination of substances of unknown composition.

The usual reagents, hydrochloric acid, hydrogen sulphide, ammonium sulphide and ammonium carbonate are used for the precipitation of the metals of the first four groups. The scheme for the identification of anions is, with certain changes, the scheme published by the author elsewhere. In this scheme the anions are divided into seven groups, the reagents for the first five groups being silver nitrate and barium nitrate.

A good feature of the book is the insertion of the table of solubilities which is included in the Appendix. This table is likely to be much used by the students. The instructions and explanations given throughout the book are generally very clear and concise.

H. F. H.

THE ELEMENTS OF COLLOIDAL CHEMISTRY. By H. Freundlich, translated by G. Barger, F.R.S. London: Methuen and Co., Ltd. 1924. Pp. 210. 7s. 6d.

This book forms an abbreviated edition, with the excision of numerical data, of Freundlich's treatise on *Capillary Chemistry* (*Kapillarchemie*), and is intended as an introduction to the chemistry of colloids. This description of the author is really a criticism of the book; it marks its advantages and weaknesses. A book of 210 pages can hardly be considered a mere introduction; as a matter of fact it is full of interesting information which frequently touches upon other branches of science. Its reading, therefore, assumes a fair amount of knowledge. At the same time the omission of figures and data in a book of this size deprives the memory of the reader of a great support: mere generalisations are apt to give the student an exaggerated idea of the achievements of experimental science and convey the impression that there are no "new Continents" to discover. This weakness, however, is negligible in comparison with the general excellence of the volume. Twenty-eight illustrations and graphs and six tables support a lucid and suggestive narration of the observations and theories of colloid chemistry. Capillary action and, based on it, phenomena of adsorption are thoroughly discussed in that interesting manner which results from enthusiasm and supreme faith in one's views. Professor Barger's translation of the book is an example of excellent scientific English. He has shown great courage in introducing or popularising a number of words, thus avoiding circumlocution. The volume is well edited and printed, and will provide absorbing and useful reading for all interested in the chemistry of colloids.

S. P. S.

A SYSTEMATIC HANDBOOK OF VOLUMETRIC ANALYSIS. By Francis Sutton, F.I.C., F.C.S. Eleventh edition, revised throughout with numerous additions by W. Lincoln Sutton, F.I.C., and Alfred E. Johnson, B.Sc., F.I.C., A.R.C.Sc.I. London: J. and A. Churchill, 1924, pp. xii+629. 35s.

The appearance of a new edition of this well known book will be generally welcomed. During its long life of over 60 years "Sutton" has been frequently brought up to date, but the last edition was published as long ago as 1911. The original author's son and Mr. A. E. Johnson have now under-

taken a thorough revision of the book, much of which has been entirely re-written. In spite of the adoption of a uniform type throughout (former editions had "methods of procedure" printed in smaller type), the size of the book has been kept down practically to its former dimensions. The section on Gas Analysis, by Mr. H. Hollings and Dr. J. S. G. Thomas, is quite new, and forms a self-contained treatise of about one hundred pages. Among other features this section contains a description of the ingenious apparatus designed by Bone and Wheeler. The section on burettes, pipettes and graduated flasks has been re-written, and details are given of the methods of standardisation in use at the National Physical Laboratory. If the recent recommendations of the Joint Committee for the Standardisation of Scientific Glassware are adopted, including the substitution of the true millilitre for the Mohr c.c., this section will unfortunately soon be out of date. The introduction of a section on the ionic theory and Ostwald's theory of indicators is of doubtful value; we should have preferred to see an amplification of the parts of the book dealing with the preparation and standardisation of solutions and some discussion of the relative value of different substances as absolute standards. It is a disappointment, too, to find no account of the new electrometric methods of titration, which have been developed so much in recent years by Kolthoff and Treadwell. Perhaps, however, such special methods were considered beyond the scope of the book. In the general part many new methods are given, and the inclusion of references to original papers greatly increases the value of the book, especially to the Works chemist, who has frequently to devise his own methods to suit his particular circumstances.

E. H. R.

ALLEN'S COMMERCIAL ORGANIC ANALYSIS. Fifth Edition, Vol. II. Fixed Oils, Fats, Waxes and their Products. London: J. and A. Churchill. Pp. 807. 30s.

In the fourteen years which have passed since the publication of the fourth edition of the above work, probably no branch of analytical chemistry has undergone such changes as that of the so-called fixed oils. In particular, the introduction of hydrogenated products has necessitated a revision of many of the older criteria of purity and of the previously valuable methods of identification of individual oils by the ratio between various chemical and physical constants. Much progress has also been made in our knowledge of the individual constituents of oils and in the analytical methods themselves. For all these reasons the appearance of the fifth edition will be welcomed.

As before, the volume consists of ten sections, each written by a recognised authority on the subject treated; but some three hundred pages of new matter have been added. These deal principally with recent advances in analytical practice, and include a detailed description of both British and American standard methods. The section dealing individually with each of the commoner oils contains much condensed information; and in most cases the physical and chemical constants of typical samples are given in tabular form. Linseed oil is, as in previous editions, described in a special section, and the book also contains monographs on butter fat, lard, the higher fatty acids, soaps, glycerine, wool-fat and the sterol alcohols.

In examining fatty products the analyst has in almost every case to be content with determining the properties of a complex mixture as a whole, without making any attempt to separate it into its ultimate constituents, although a separation into arbitrary fractions may sometimes be made. Accordingly, most of the methods of analysis are necessarily rather those which have been found in practice to give useful indications of the nature or quality of a product rather than methods for the identification and estimation of chemically simple constituents. The list of contributors is in itself a guarantee of the standard nature of the work; and, in view of the large amount of fresh material, the new edition may well be acquired, even by those who already possess the older ones.

In reading through the volume a number of minor misprints were noticed, principally in the references and in other matter outside the normal text; but on the whole the book is relatively free from errors of this sort. The paper, printing and binding are exceptionally good.

E. B. M.

C

The Handling and Use of Liquid Chlorine

The development of the use of liquid chlorine is one of the most important features of late years in the heavy chemical industry. The Castner-Kellner Alkali Co., Ltd., were the first to supply this product, in 1909, and the following notes are taken from a pamphlet recently issued from this firm for the guidance of chlorine users.

Liquid chlorine is now delivered in quantity in steel cylinders or tank wagons, as required. It is dry and pure, and does not suffer deterioration in storage, so that it is now used in any convenient place to carry out chlorinations which were impossible a short time ago, when chlorine was available only in the form of its compounds or as a moist impure gas.

Liquid chlorine can be handled quite easily without risk, provided that the necessary precautions are taken, and the workmen have by experience become confident that they can manipulate the plant without danger.

Uses of Liquid Chlorine

The uses of liquid chlorine include the preparation of bleach liquor, the production of metallic chlorides, the manufacture of dyestuff intermediates and of non-inflammable solvents, and sterilisation.

Considerable quantities of liquid chlorine are used by bleachers and paper-makers in the preparation of bleach

lik^e. Large quantities of liquid chlorine are used in the production of intermediates for dyestuffs. In some cases chlorine is used as an oxidising agent, e.g., in the production of permanganate of potassium or sodium, calcium arsenate, and ferricyanides. The detinning of tin scrap is carried out using chlorine, whereby tin tetrachloride, a liquid which is used for the weighting of silk fabrics, is produced. An aqueous solution of chlorine is the most powerful disinfectant, and the sterilisation of drinking water and waste water by means of liquid chlorine is very important. Liquid chlorine is also used for the bleaching and maturing of flour. Recently chlorine has been used successfully in the production of pure cellulose from wood, straw, and various grasses.

Hints on Handling Vessels

Liquid chlorine is supplied in cylinders containing 70 lb., and in tank wagons containing 12 to 13 tons. Chlorine cylinders are annealed and tested at regular intervals to 50 atmospheres pressure; the tank wagons are tested to 350 lb. per square inch. According to the purpose for which chlorine is required, so the type of cylinder varies. One type of cylinder is arranged to deliver chlorine gas, which is desirable where the chlorine consumption is slow. In the cases where the chlorine gas enters into reaction rapidly, it is advisable to use a container which is arranged to deliver liquid chlorine, the principle being the same as in the soda-water siphon.

When not in use chlorine cylinders should have the protecting cap screwed down over the valve. The valve outlet is also protected by a cover nut which should always be screwed home when the cylinder is not in use. The protecting cap prevents damage to the valve, whilst the outlet cover nut protects the valve spindle and its seating from moisture.

The valve of a chlorine cylinder generally opens easily when a valve spanner is used. Sometimes, and particularly after long standing, a valve spindle sticks. Lubricants, paraffin oil, and the like must not be applied to chlorine valves which have become stuck. The use of great force

on the valve spanner should be avoided, and in case of difficulty an iron ring (say a 3-inch coupling) should be made black hot and placed over the valve for one or two minutes. During this period of heating the valve should be tried and should become free. If this treatment fails, the cylinder should be returned to the works. The valve spindle when made loose should be kept moving as the valve cools down.

There are two types of connections in use for discharging liquid chlorine. One consists of a recessed nut, through which a collared pipe passes. The collared pipe, provided with a lead or dermatine washer, is fitted to the outlet of the valve, and a tight joint is made by screwing the recessed nut on to the valve outlet (Fig. 2). The other type consists of a stirrup which fits over the valve body. A recessed boss holds the collared pipe and a tight joint is made by means of a hand-screw working on the back of the valve. This stirrup connection is recommended because it saves time, it saves wear on the threads of the valve outlet, and it does away with all dangers from a misfit between the threads of the valve outlets and of the coupling nut.

Liquid chlorine is anhydrous, and it is essential for its safe storage that the containers should also be perfectly dry and should be kept dry. This, a matter of considerable importance, should be borne in mind by the users of liquid chlorine for the reason that the reaction between chlorine and many substances to be treated is so rapid that a good supply of chlorine

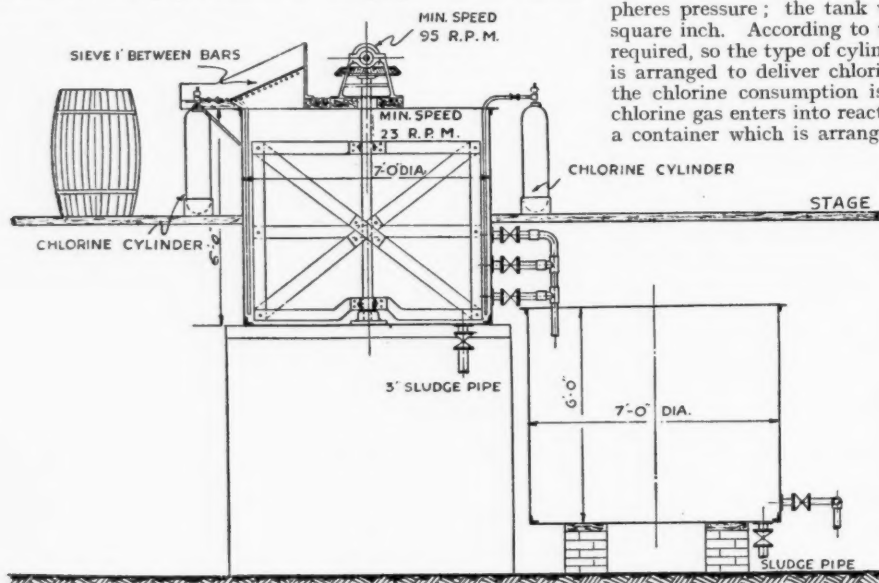


FIG. 1.—DIAGRAMMATIC REPRESENTATION OF BLEACH DISSOLVING PLANT.

liquor. Bleach liquor is prepared by dissolving bleaching powder in a vat which is provided with an agitator. Calcium hypochlorite, the bleaching agent, is formed in the solution, leaving a sludge which consists essentially of lime mud and occasionally lumps of bleaching powder. This sludge, even after washing, carries away to the dump an appreciable quantity, frequently as much as 10 per cent., of the available chlorine.

The recent practice of using liquid chlorine in conjunction with bleaching powder in the preparation of bleach liquors has shown that there is an improved dissolving of the bleaching powder, the lumps are broken down, the lime sludge and the chlorine react to produce more bleaching liquor, and the volume of the sludge remaining is only 25 per cent., or less, of that obtained by the old method. Moreover, the percentage of available chlorine in this sludge is very much less than that in untreated sludge. In addition, the bleach liquors produced are stronger, so that fewer mixings are required, and there is a corresponding decrease in the cost of labour. By chlorination it is possible to obtain a considerable increase in the output from a given plant. The process is easy to control, and no special plant is required.

Liquid chlorine is used for the preparation of the chlorides of sulphur, the chlorine derivatives of ethane and ethylene, carbon tetrachloride, phosgene, sulphuryl chloride, aluminium chloride, phosphorus chlorides, silicon tetrachloride, and the

must be maintained in order to prevent a back suction into the cylinder of the substance which is being chlorinated; if the substance to be chlorinated is organic, and by some mischance some of this material is sucked back into a cylinder, which is almost empty, there is grave danger of explosion. In the same way aqueous solutions are sometimes sucked back into cylinders, with the result that rapid corrosion inside the cylinder takes place, and the generation of gases may cause an explosion.

Where chlorine gas is used for chlorination it is advisable to place a Woulff's bottle, containing strong sulphuric acid, between the cylinder and the chlorinator.

Where liquid chlorine is discharged through a pipe-line direct into the chlorinator it is not possible to use the above-mentioned safety device, but in this case it is possible to say when the cylinder has become empty by observing the pipe connecting the cylinder to the apparatus. If chlorine is passing the pipe will be coated with hoar frost and, as soon as

valves of the tank wagon are then opened, compressed air is admitted to the tank wagon by opening the inlet valve. Then the inlet valve of the storage tank is opened, and finally the overflow valve of the storage tank is just released from its seating in order to by-pass air containing some chlorine to the reaction vessels. Liquid chlorine will then be transferred to the storage tank, and the transference will be completed in about twelve hours. This is seen by frosting of the by-pass main.

For use with liquid chlorine in tank wagons and storage tanks it is essential that the compressed air shall be perfectly dry and free from lubricating oil, otherwise the presence of moisture alone or moisture and oil will cause corrosion inside the tank. Dry air for the above purpose is conveniently obtained by passing it through three towers in series. The first one should be empty and serves as a catch pot for oil and water. The other two, provided with perforated false bottoms, should be filled with anhydrous calcium chloride. All three towers should be provided with drain taps, which should be opened at regular intervals.

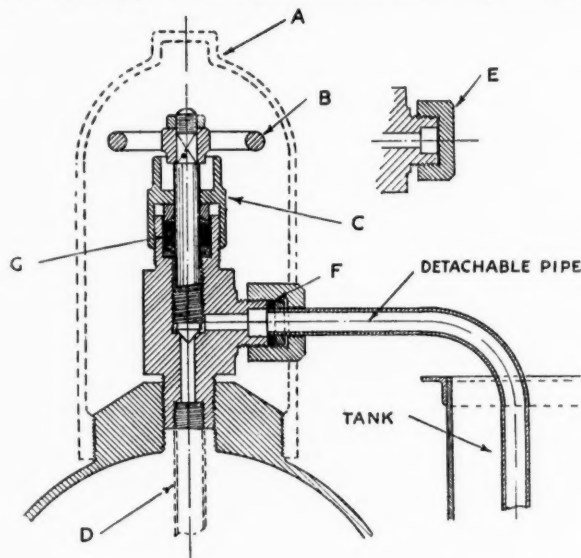


FIG. 2.—UNION CONNECTION FOR CHLORINE CYLINDER.

- A.—Protecting cap.
- B.—Spindle wheel.
- C.—Gland nut.
- D.—Internal pipe for liquid chlorine.
- E.—Cover nut.
- F.—Dermatine or lead joint ring.
- G.—Hard rubber and steel washer.

the hoar frost disappears, i.e., melts, the flow of chlorine will have ceased. The cylinder should be immediately disconnected and the cover nut and protecting cap replaced.

Supply in Tank Wagons

Where the consumption is sufficiently large, and where adequate technical supervision is available, liquid chlorine is supplied in tank wagons, and the following notes concerning the handling of large quantities will be found useful. A tank wagon is intended solely for the transport of liquid chlorine, and its contents should be transferred immediately to a storage tank in the works. The storage tank should be of the same capacity or larger than the tank wagon and of the same construction.

The man-lid of a tank wagon or storage tank is provided with four valves. Two of them are outlet valves which are provided with pipes running to the bottom of the tank, and liquid chlorine is discharged through them. Of the remaining valves one is the inlet and the other valve is the overflow. The method of transfer of liquid chlorine from the tank wagon to the storage tank is as follows:—The outlet valves of the tank wagon are connected to the inlet valve of the storage tank. The overflow valve of the storage tank is permanently connected to a by-pass leading to a reaction vessel. A source of perfectly dry compressed air at 150 lb. per square inch is connected to the inlet valve of the tank wagon. The outlet

The "Murray" Wall

Water Cooled Combustion Chambers

A NEW invention, just introduced into Great Britain, is the "Murray" steel tube water cooled combustion chamber wall. It is applicable to any method of firing, but is perhaps chiefly of interest because it has now enabled mechanical stoker firing on large water tube boilers to obtain efficiency results equal to the latest principles of pulverised fuel, and in fact on both systems we now seem to have arrived at the remarkable figures of 92 per cent. boiler plant efficiency on short tests and 90 per cent. for continuous performance.

The "Murray" tube consists essentially in constructing the two combustion chamber side walls of 4-in. steel tubes, placed close together, through which the boiler feed-water circulates, entering a common header at the bottom and being discharged into the boiler through corresponding headers at the top. This gives a very great increase in the net heating surface of the boiler. Mr. Thomas E. Murray, the inventor, is a very well-known combustion engineer in the United States. He is the designer of the famous Hell Gate power station in New York, and the world's patents are controlled by the Combustion Engineering Corporation of New York, the European rights being held by the Underfeed Stoker Co., Ltd., of London. The first installation was fitted about nine months ago at Hell Gate on four boilers, and results of a thorough series of tests and investigations are now available.

The 4-in. tubes are of solid drawn steel, placed side by side at 7-in. centres and both sides of the tubes are provided with $\frac{1}{2}$ -in. steel flanges or fins welded on, one of which is $1\frac{1}{2}$ in. wide and the other $2\frac{1}{2}$ in. from the tube surface. These fins come together, a long and a short one always overlapping, so that the whole surface of the wall is composed of 4-in. water-cooled steel tubes with 3 in. of flat overlapping steel plate between. Behind this tube wall there is built another light wall $2\frac{1}{2}$ in. thick of firebrick, together with $2\frac{1}{2}$ in. thick of some insulating material simply to prevent air leakage.

The chief cause of the high efficiency of the "Murray" tube is not so much the increase in the heating surface as the greatly improved radiant heat transmission. In most water-tube boilers the two or three rows of tubes nearest the fires have to do nearly all the work because the other tubes are only heated by conduction and convection, and the "Murray" tubes are a very great addition to this actual active tube surface next to the combustion chamber itself, quite a different thing from adding more "dead" tube area. No signs of wear and tear are stated to be noticeable after eight months' continuous running, and it seems evident that another considerable advance in steam boiler practice has been made.

Pure Paraffin Crystals

A NEW process for the manufacture of pure paraffin crystals forms the subject of a recent booklet published by W. J. Fraser and Co., Ltd., of Dagenham, Romford, Essex. The object is to obtain from the filter press cakes a paraffin scale from which pure paraffin crystals can be easily extracted by simple sweating. The process is based on the hitherto unknown fact that paraffin wax under certain circumstances is precipitated from the oil solution.

False Declarations of Value

Heavy Fine on Chemical Importer

ON a charge of making false declarations of the value of imported essential oils and perfumes, Mr. K. B. Mavlankar, an importer, of 6, 7 and 8, Beauchamp Street, London, was summoned before the Lord Mayor (Sir Alfred Bower), at the Mansion House, London, on Friday, January 2, at the instance of H.M. Customs and Excise. There were five summonses, concerning five consignments of goods declared in August last, the total declared value of which was £699, the actual price paid being £1,024. Only two summonses were proceeded with and the consignments concerned were (1) 150 kilos of ethyl phthalate, 140 kilos of methyl anthranilate, and 1,820 kilos of methyl salicylate, the declared value being £238 8s. 4d., and the price paid £319 18s.; (2) 500 kilos of musk xylol, the declared value being £312 10s. and the actual price paid being £482 5s. 2d. The amounts of duty and reparations levy lost to the Crown (the two consignments came from Germany) were £31 and £65 respectively. The remaining three consignments, the summonses with regard to which were not proceeded with, consisted of 434 lbs. of heliotropine and 112 lbs. of ethyl benzoate, declared value £86 4s. 2d.; 2 cwts. of aubepine, declared value £28 and 88 lbs. of artificial mustard oil, declared value £33 17s. 6d.

Case for the Prosecution

MR. T. G. GIBSON, for the Customs, said that not all of the five consignments came from Germany, but the consignments covered by the two summonses were from Germany, and therefore, in those cases, the Crown had lost, as the result of these under-declarations of value, not only a portion of the Customs duties, but also a portion of the German reparations levy. A person who under-declared the value of imported goods reaped a considerable benefit thereby, inasmuch as he was able to undercut his competitors and do extensive business. The declarations in these cases were made by the clerks of the defendant, on his instructions.

When the Customs officers visited the defendant's premises and made inquiries, all the information required was supplied to them, and the defendant put one of his clerks at the disposal of the officers, with instructions to show them everything they wished to see. It was ascertained that considerably higher prices were paid to the consignors than had been declared to the Customs, and one document, a copy of an order to consignors, contained instructions to the latter to invoice goods at lower prices than those actually paid. The defendant had ordered 1 cwt. of ethyl benzoate at 2s. 4d. per lb., to be invoiced at 1s. 4d. per lb.; 1 cwt. of citral at 5s. 6d. per lb., to be invoiced at 3s. 6d. per lb.; and 2 cwts. of aubepine at 9s. per lb., to be invoiced at 5s. per lb.

On September 23, 1924, the defendant wrote a letter to the Customs authorities, admitting responsibility. In this he admitted that, being driven to a large extent by the force of unfair competition, he had committed a most inexcusable wrong, by submitting false invoices and obtaining delivery of goods, thus depriving the British authority of certain sums. He was deeply conscious of the enormity of his crime, for which he alone was responsible, and was ready for such punishment as the authorities saw fit to inflict upon him. One statement made in this letter was that there was a widespread practice in the trade of submitting such false invoices, which created unfair and ruinous competition, and rendered it difficult, if not impossible, to carry on a profitable trade by honest and straight means. The defendant did not plead this as an excuse, and did not desire to injure any of his competitors, but mentioned it in order to explain the circumstances. He was ready to pay the balance due to the Key Industries Department of the Customs, and any fine that might be imposed upon him, as well as to give an undertaking that this or similar offences would not be repeated in the future. He appealed to the authorities on the grounds of his past record, his age (now 54), and the fact that his business had been built up by a quarter of a century's hard work, and gave employment to 14 or 15 English employees, who would be unemployed if he were not able to carry on his business.

Subsequently, a cheque for £237 2s. 11d. was received by the Customs, which had been retained on deposit by the latter on account of the under-payment of duties and levy, without prejudice to any proceedings which might be taken.

The Customs were prepared to accept the prices paid for the goods as being the actual value.

The Defence

MR. ARTHUR W. ELKIN, for the defendant, said that Mr. Mavlankar was an Indian of high caste, with a status in this country. He had signed the cheques submitted to him by his clerks, and made payable to the Customs authorities, but had had nothing to do with the actual arrangements.

When it was pointed out by the LORD MAYOR that the employees, having no financial interest in the business, had no object in making false declarations to the Customs, Mr. ELKIN replied that, however that might be, a reprehensible and grossly improper practice had arisen in the trade, and had prevailed in one department of the defendant's business. This was the department dealing with synthetic chemicals, but it was quite a small part of the whole business. The business was established in 1908, and the defendant had had an unblemished character in the trade up to the time of these proceedings, and a considerable standing. All his trading in the synthetic chemicals involved in these cases amounted to less than 1 per cent. of the total purchases made by him, and he was not, therefore, making large sums of money as the result of these transactions, the total sum involved being £237 2s. 11d. The fact was that, when the Customs officers were inquiring into an isolated transaction, the defendant gave instructions that a complete and comprehensive examination should be made of other transactions. A schedule of all under-stated transactions was drawn up, involving an under-statement of duties to the extent of £237 2s. 11d. As had been acknowledged on behalf of the Customs, all information had been placed at the disposal of the Customs officers.

The LORD MAYOR said that there had been a deliberate attempt to defraud the State, and that it had been done systematically; there were five cases in one month. But the defendant appeared to have a good record, which the Customs authorities did not dispute. He imposed a fine of £500 on each of the two summonses, plus costs of £5 5s. in each case; the amount to be paid in one week, the penalty for default being three months imprisonment.

The summonses were brought under Section 168 of The Customs Consolidation Act, under which the maximum penalty is £500, or imprisonment up to a period of two years.

A Disclaimer

WITH reference to the suggestion, in the course of the hearing, that the practice of making false invoices is widespread, Mr. Bromfield, secretary of the British Chemical and Dyestuffs Traders Association, writes on behalf of his members strongly repudiating the statement. "The recognised firms of high repute and long standing in the trade," he states, "resent this suggestion of malpractice as a general and everyday part of their business."

Chemical Inventor's Death

A Formula for Cheap Synthetic Nicotine

JOSEPH BORN, a German chemist living at Earl's Court, London, poisoned himself on Thursday, January 1. At the inquest on Tuesday it was stated that Born, who was a German, had come to England to sell his inventions, but had met serious financial difficulties.

Mr. G. G. Whiffen, of Whiffen and Sons, Ltd., Battersea, said that Born approached him in December last with the formulae of several synthetic chemicals. In the case of one, synthetic nicotine, he understood that the new process rendered production possible at about 4s. per lb., whereas the ordinary production cost 15s. per lb. Whiffen and Sons, Ltd., suggested a demonstration, and if satisfactory they would consider taking over world rights.

The coroner mentioned that £2,000 was offered Born if the formula proved satisfactory. Whiffen and Sons, Ltd., had offered £50 towards Born's working expenses when experimenting at their laboratories, but later they received a letter stating that Born was in financial straits and proposed to commit suicide. He was found dead in Kensington Gardens on January 1.

The Coroner expressed the hope that the German Consulate would examine Born's papers to see if there was anything in his inventions.

Dr. Ludwig Mond

Professor H. B. Dixon on His Life and Work

PROFESSOR H. B. DIXON, F.R.S., of Manchester University, lectured to a large audience at Northwich on Wednesday on "The Life and Work of Dr. Ludwig Mond, F.R.S."

With the late Sir J. T. Brunner, Bart., Dr. Mond founded the world-famed chemical firm of Brunner, Mond and Co., and it is a noteworthy fact that sons of both are prominently associated with the great concern at the present time.

PROFESSOR DIXON, referring to the meeting of Sir John Brunner and Dr. Mond at Widnes, said they were both in the same firm of John Hutchinson.

Following a discussion, it was agreed that Mond should see Solvay and ask to be shown his works using the ammonia process for the conversion of salt into carbonate of soda, with a view to taking a licence from him. This was done, and Mond predicted a success.

They bought the Winnington Hall estate, which had a long frontage of the navigable river Weaver, with easy access by water to Liverpool and with the Cheshire Lines Railway.

First Soda Produced

In April, 1874, they produced their first soda. It was a year of trial and stress; they both worked all day and took the night shift by turns. There were many troubles due to defects in plant. During 1874 they made 838 tons of soda and lost about £5 on every ton; in 1875 they made 2,400 tons and a profit of £1 a ton. The tide had turned. Two years later the plant was doubled, and in the following year they took over the management of the rival Solvay plant erected at Sandbach. In 1881 the limited company of Brunner, Mond was formed, mortgages were paid off, and the era of expansion and success was fully entered upon.

Professor Dixon said that perhaps the position of the works of Brunner, Mond and Co. and the ability of their staff to deal with a new chemical industry could have no better illustration than the record they accomplished in the Great War. One of the most pressing demands was for ammonium nitrate to form high explosives when mixed with tri-nitro-toluene and other substances. Ammonium nitrate had been manufactured in comparatively small quantities in this country before the war, and most of it had been made by the direct union of nitric acid with ammonia. The necessity was a great output by a rapid and if possible economic method. The Ministry of Munitions turned to Winnington, and not in vain. The sources available for making nitric acid were the natural Chile saltpetre and Norwegian calcium nitrate made from synthetic nitric acid. Calcium nitrate could be easily converted into insoluble calcium carbonate by carbonated ammonia, leaving a solution of ammonium nitrate. A portion of the ammonia soda plant at Lustock Gralam was immediately adapted for the purpose, and as the demand grew, more and more units were erected and put into operation. Meanwhile another portion of the plant was used to make soda from sodium nitrate instead of from brine. By 1917 the Lustock works were supplied with pure crystals of calcium nitrate manufactured by Brunner, Mond and Co. at Plumley and the Victoria Works at Wincham. A still cheaper method of making ammonium nitrate was worked at Sandbach, and in September, 1917, a new plant was erected at Swindon, and before the end of the year was largely contributing to the supply.

The combined output reached its maximum in 1918, when Brunner, Mond were manufacturing 327 tons of ammonium nitrate per day. In all, they turned out 216,000 tons. But that mass of explosive material was not the only contribution made by the firm to the development of the British and Allied warfare. T.N.T. was made at Gadbrook, and the preparation of synthetic phenol, to be converted into another high explosive (picric acid), was also undertaken by Brunner, Mond & Co.

Mr. Roscoe Brunner, the chairman of the company, and the younger son of the late Sir John Brunner, presided.

The "C.A." Trade Guide

It will be noticed that our Trade Guide pages have been reconstructed in a new and more attractive form, which, judging by the number of entries already received, appears to appeal to chemical and chemical engineering firms. Particulars may be obtained from the Manager, THE CHEMICAL AGE, 8, Bouverie Street, London.

The Cascade System of Tar Distillation

A Simple Patented Device

AN illustrated pamphlet just issued by Clayton, Son and Co., Ltd., of Hunslet, Leeds, draws attention to the "Cascade" system of tar dehydration and distillation. At the present time, as tar producers know, there is a good market for dehydrated tars for road-making purposes, while tar distillation products are also in fair demand, so that the refining of tar is an operation usually yielding considerable profit if it is economically carried out. The chief requirements of a good tar still are:—(1) simplicity of design, (2) low fuel consumption, (3) adaptability for working to different specifications for the products, and (4) freedom from priming.

The "Cascade" arrangement adopted by Clayton, Son and Co. in their tar stills is a very simple one. As the tar enters the still, after being warmed by the outgoing tar in a heat interchanger, it flows down a series of shallow troughs inside. Whilst passing over these troughs the tar has a very large surface exposed to the hot vapours arising from the main body of tar in the still, and thus the water is removed along with a portion of the more volatile oils. After passing down the cascade the tar commences its traverse of the still, the depth of the tar here being about one-third the diameter of the still (which is of horizontal cylindrical form). A contra-flow system between the tar and the hot furnace gases is arranged throughout, so that as the tar flows along the still its temperature increases and the higher boiling oils are driven off.

Dehydration or Distillation

When working for a dehydrated tar for road making purposes one still alone is used, and the temperature is adjusted to obtain tar of different specification. Thus, for No. 1 Road Board Tar the temperature should be about 400° C., while No. 2 Specification tar can be obtained by simply raising the working temperature to about 450° C.

When distillation products are aimed at, three stills are used in series, the first producing the light oils as in the dehydration process. The second still is similar in nature and working at 500° C. the light creosote and carbolic oils are driven off. In the third still the temperature is also maintained at the same level, but a little steam is blown through it. By this means the heavy and anthracene oils are driven off. The residue is a hot pitch, which passes through an interchanger to warm the incoming tar, and then passes to suitably arranged pitch bays, where it sets hard and can be broken up and removed. The vapours from each still pass to separate condensers and thence to the three storage tanks for light, heavy and middle oils.

The furnace for heating is of the ordinary type, and can be arranged for either gas or coke, the latter being the cheaper to work. Owing to the efficiency of the heat interchanging system 40 per cent. of the waste heat in the outgoing tar is recovered, and it is possible to dehydrate one ton of a normal tar to No. 2 specification with a fuel consumption of less than 100 lb. of coke.

Nottingham's Chemical Industry

A REVIEW of Nottingham's chemical activities appears in a Trade Supplement of the *Nottingham Guardian*.

So far as Nottingham was concerned business had been quiet generally. Manufacturers were still labouring under the disadvantage of unfair competition from countries with depressed currencies; but, nevertheless, the year 1924 had another one aspect, which was of great national as well as local importance. For the first time in the history of the chemical trade in this country definite attempts had been made to educate the general public in chemical matters. Steps had been taken to let people know what our chemists were doing. In many towns the local sections of scientific societies had arranged public lectures on scientific subjects, and it was a scheme which should be prosecuted to its fullest extent. These facilities in Nottingham were very extensive, and for the benefit of the trade as a whole the time was opportune for a message to the Nottingham section of the Society of Chemical Industry exhorting them to consider the advisability of redoubling their efforts during 1925.

A Survey of the Benzol Industry

Description of Research Work

A PAPER entitled "An Early Chapter in the Benzol Industry" was read at the meeting of the London Section of the Society of Chemical Industry on Monday, January 5, by Mr. Wilfred Irwin.

MR. IRWIN mentioned that this year marks the centenary of the discovery of benzol, and another point which gave interest to the paper was the advent of new processes—the activated carbon process and the silica gel process—which, in the author's opinion, appeared to be the first serious rivals to the old oil scrubbing process.

After mentioning the discovery of benzol by Faraday in 1825 and the large increase in demand following the discovery of mauve by Perkin in 1856—with a consequent increase in price from 3s. per gallon to over 15s. per gallon—Mr. Irwin told the story of how, at the request of his firm, Messrs. Harman of Manchester, he endeavoured to improve the sources of supply, there being, in 1881, a great scarcity of benzol. His laboratory experiments proved that the extraction of benzol from coal gas could be made a profitable proposition. After obtaining from 3 to 3½ gallons of a mixture of 70 per cent. pure benzol and 30 per cent. pure toluol from 10,000 cubic feet of the 19 c.p. gas then supplied by the Manchester Corporation, the work was transferred to the then new Bradford Road works of the Manchester Gas Department where, on the basis of gas at 3s. per thousand cubic feet, forward contracts were made for the supply of benzol at 10s. per gallon. This price was obtained when using good coal and cannel as fuel, but later on coke was substituted, ordinary fireclay horizontal retorts being used. This, however, led to a reduction in the production of benzol to 1½ gallons per ton of coal carbonised. By using the gas obtained from the process, after the extraction of the benzol it was found that, owing to the greater heats obtained, the production could be increased to 2½ gallons per ton of coal carbonised. It had not been discovered up to that time that high heats favoured the production of benzol and Mr. Irwin claimed that his firm were the first to make the production of benzol both a practical and a commercial success, although he gave credit to other workers who were investigating at the same time.

In his search for a most suitable absorbent, it was found that light creosote oil gave the best results and plants working on the lines of the experimental one at the Bradford Road works of the Manchester Corporation were installed in various parts of the country, the output amounting to between 6,000 and 7,000 gallons a week. Owing to this increased output, however, the price fell to 1s. per gallon which was unremunerative. In these circumstances, attention was turned to the use of benzol to enrich coal gas used for lighting purposes and considerable success was attained in this direction until the advent of the incandescent mantle made the use of benzol to improve the illuminating value of the gas unnecessary. The later development of benzol production from coke ovens was mentioned as was the fact that the output at one time went up to between 100 and 200 million gallons per annum as against 1 to 2 million gallons during the early days of Mr. Irwin's experiments.

Little Progress Made

DR. J. A. LESSING commented on the fact that in spite of the tremendous progress made in science and industry generally during the period since Mr. Irwin began his work on benzol, very little real progress has been made in the efficiency of benzol production. The original process worked by the author must have been as efficient as, if not more efficient than, the benzol plants at coke ovens to-day and he knew of cases in which, by just a little adjustment, it had been possible to improve both the yield and purity of the product. Even though gasworks had produced large quantities of benzol during the war, much more could have been done had not the methods employed been so haphazard and not up to the high standard possible. Although in the case of gasworks it was a question of whether therms in the gaseous or liquid form paid the better, personally he believed it would pay to extract every ounce of benzol, in view of the growth in the motor industry—and endeavour to improve carbonising processes to increase the yield of gas.

The New Soluble Vat Dyestuff

Sir William Alexander's Views

IN discussing with a representative of the *Morning Post* the announcement in last week's *CHEMICAL AGE* of the production of a soluble anthraquinone vat dyestuff, Sir William Alexander (just returned from his American tour) drew attention to the fact that dyes, as used in industry, are derived from three great sources, benzol, naphthalene and anthracene, all coal tar products, the last from which anthraquinone is derived, forming the basis of the so-called vat dyes.

"These," he said, "have the advantage of being the fastest of the various dyes, but they are costly and have the disadvantage of being insoluble, thus requiring an elaborate process for their application. To appreciate what would appear to be the significance of the announcement in *THE CHEMICAL AGE*, it is necessary to remember that Durand and Huguenin placed on the market some time ago a new derivative of artificial or synthetic indigo which made its application easier, and also increased the field in such directions as calico printing. This product was known as 'Indigisol.'

"The effect of this discovery may well have been to stimulate investigation by a number of manufacturers to go a stage further in the way of simplifying the use and the process of applying vat dyes. Doubtless Scottish Dyes, Ltd., have been working for some time in this direction, but others, such as the British Dyes Corporation and some of the German firms, have not been idle. British Celanese, Ltd., also, in their research on the solution of dyeing Acetyl silk about eighteen months ago discovered, and were the first to adapt on a large commercial scale the possibility of 'solubilising' insoluble colours by a colloidal process, and thereby making the dyeing of this fibre simple and effective. Patents were taken out for these dyes and methods, which are to-day on the market as S.R.A. colours.

"The move of Scottish Dyes, Ltd., is certainly one in the right direction, for I am convinced that we shall not make any great progress in providing new dyestuffs. Advance will lie rather in the adoption of the methods of colloidal chemistry. We should be able to get greater homogeneity in our results and improve the fastness of colours. Hitherto, there has been the danger that when colours have been prepared in colloidal form they may again separate out, but it is now possible by using a substance, known as a dispersoid, to ensure the maintenance of that fine form of division which is one of the properties of a colloidal solution. To make my meaning clear. Water and oil can be so shaken as to form an emulsion, but the two are apt to separate back into oil and water. If a substance known as a dispersoid is present, the water and oil remain intimately mixed, though the dispersoid apparently exerts no chemical action. It can in some way be compared with the class of bodies known as catalysts, except that it remains as part of the finished product. So it is, too, with these dyestuff preparations. As I have said, I believe the future lies in making a better use of the dyes we have rather than in attempting to find new ones, and in so far as Scottish dyes have succeeded in advancing on these lines I welcome their achievement."

United Alkali Staff Changes

SEVERAL important changes in the staff of the Widnes works of the United Alkali Co., Ltd., are announced. The organic department of the Pilkington-Sullivan works has been created a separate works, of which Mr. A. E. Wareing, the present manager of the Gaskell Deacon works, has been appointed manager. Mr. J. Morton, assistant manager of the Pilkington section, retires after long and useful service, and Mr. R. F. Eastwood, assistant manager of the Sullivan section, has been promoted to process superintendent of both the Pilkington and Sullivan sections. Mr. J. Williams has been appointed assistant manager to Mr. Latham. Mr. Williams is succeeded as works engineer by Mr. W. Towns. Mr. C. S. Imison has taken over the management of the Gaskell Deacon works.

Mr. J. J. Latham, manager of the Pilkington-Sullivan works, has just celebrated the fiftieth anniversary of his connection with the works, and the occasion was marked by the presentation to Mr. Latham, by the company, of a handsome salver at a dinner at which he was the guest of the directors.

Silicate of Soda and Concrete

Valuable Hardening Properties of "P.84 Silicate"

It has been known for many years that silicate of soda in the form of water-glass had a beneficial effect when it was added to concrete, increasing the hardness to a considerable extent; the results, however, were often uncertain. The hardening of concrete with silicate of soda has been the subject of research by Brunner, Mond and Co., Ltd., who have put on the market a special brand of silicate of soda which has been found to give reliable results. This silicate is known as "P.84 Silicate of Soda," and it contains a much higher percentage of silica than water-glass, which is, of course, a decidedly alkaline solution of uncertain composition. The P.84 silicate is in the form of a syrup which readily mixes with cold water, and has to be diluted before it is applied to the concrete.

Method of Application

The silicate is not added during the mixing, but it is applied afterwards to the dried surface, or to existing concrete. Working with large quantities, the cost of treatment is only about one halfpenny per square yard. The treated surface becomes hard and wear-resistant. Those who visited the British Empire Exhibition last year will remember seeing the abrading machine at the Brunner-Mond stand, which worked on test pieces of concrete, demonstrating the value of treating the surface with P.84 silicate. The silicate sinks into the concrete to some extent and forms a hard layer, which has been found neither to form dust nor to become slippery under wear. It is possible to get a greater degree of penetration of the silicate by allowing the concrete to soak in a more dilute solution, a method which is practicable in the case of slabs, blocks and other comparatively small articles. It is also noteworthy that treatment with P.84 silicate renders concrete less pervious both to water and oily liquids, and so prevents rotting. The makers claim that there is no case of concrete construction in which the exposed surface cannot be hardened and preserved by the application of P.84 silicate of soda.

Theory of the Action of Silicate

The theory of the hardening of concrete by silicate of soda was at one time supposed to be due to a chemical reaction between the silicate and the cement particles, resulting in the formation of calcium silicate, but though this may take place to some extent we believe it is now considered that what happens is the formation of free silica in a hard colloidal form in the pores of the concrete. Silica in this form is particularly tough and horn-like, and well distributed among the pores of the cement it would be expected to have a very strong binding effect. If this theory of the action of the silicate is correct it will be readily seen why a silicate containing a higher percentage of silica than common water-glass, such as the P.84 silicate, should be preferable to more alkaline forms. It is a notable fact that practically all the fancy hardening agents for concrete that have been put on the market during recent years are based upon silicate of soda, in spite of the fact that some of these preparations are sold at very high prices.

P.84 silicate is described in a pamphlet recently issued by Brunner, Mond and Co., of Northwich, Cheshire, which also contains useful particulars as to prices.

New Artificial Silk Producers

ARTIFICIAL silk is now to be manufactured by Smith, Bulmer and Co., Ltd., of Holmfild Mills, Halifax, according to the statement of the chairman at the annual general meeting. Sir William Bulmer said that very thorough research and investigation had been proceeding during the last 18 months, extensive premises had been acquired eminently suitable for the purpose, and the machinery was being rapidly erected. The system under which artificial silk was to be produced had been in successful operation on the Continent for a considerable time. Certain quantities of silk had been produced during the past few months and tested, and there was an encouraging amount of inquiry for the silk. The dyeing properties of the silk were all that could be desired. In this most important feature there were no difficulties of any kind, and the ordinary dyewares now manufactured could be used by any competent dyer in the dyeing of their silk.

Chemists and the "Yadil" Dispute

At the Board of Trade offices at Carey Street, London, on Tuesday, statutory meetings were held of creditors and shareholders under a winding-up order made on a creditor's petition against Yadil Press, Ltd. It was stated by the Official Receiver that the position of the company was mainly due to an article on "Yadil" in a London newspaper by an eminent chemist.

Mr. Oswald Earp, who stated that he had held an amateur post on the staff as an investigator of the effects of Yadil, said the company possessed an asset represented by a claim for compensation against the authors of the alleged libel which had brought about the losses of the company. He thought it remarkable that Mr. Clement, an amateur chemist, should have discovered this "wonderful non-poisonous antiseptic" by the use of which hospital wards had become fresh and sweet.

The Official Receiver (interrupting): Has any action yet been commenced by the proprietors of Yadil?

Mr. Earp: The measures taken to reassure the public were delayed, and by that time the public believed that the alleged libel was true. Mr. Earp added that extraordinary difficulties had been met with in prosecuting the action. It had been found practically impossible to get an expert of first standing to make an independent analysis. He approached the expert at Oxford University, and the reply was brief and to the point: "Analyse that stuff?" the expert answered. "Not for thousands of pounds!" He wrote to another distinguished man, but his letter was not acknowledged. Another eminent man who was approached by the directors said that £10,000 would not induce him to make an analysis.

The Official Receiver: Had he tasted it?

Mr. Earp: I cannot tell. By seeking to obtain an analysis either to negative or support that of Sir William Pope, the Cambridge professor who first denounced Yadil on the ground that it contained 1 per cent. of formaldehyde, the firm would have been paying for its own death sentence. It was given as the opinion of two eminent counsel that the action could not be properly fought unless the secret process was disclosed, while in addition it was estimated that the cost of the action would approach £50,000.

It was agreed to leave the affairs of the company in the hands of the Official Receiver.

Chemical Manufacturer's Failure

THE first meeting of creditors of George Herbert Wattson, chemical manufacturer, of 133, Fenchurch Street, London, E.C., whose business consisted of buying chemicals and colours for the use of painters' grinders, was held on December 31, at Bankruptcy Buildings, Carey Street, London, W.C. The receiving order was made on December 11, on the petition of Fred Crepin, merchant, of 15, Cooper's Row, E.C., the act of bankruptcy alleged being the debtor's non-compliance with the requirements of a statutory bankruptcy notice.

A statement of affairs was submitted to the meeting in which the debtor returned his liabilities at £814 and assets at £27, absorbed, however, in the payment of preferential claims. The debtor had been engaged in the chemical trade for the past 40 years. For 25 years before 1909 he was employed by a chemical merchant. That person died in that year and the debtor then joined his late employer's son in partnership and they took over the business at 133, Fenchurch Street, London, E.C. They traded together under the style of Paul Jantzen and Co. Although no accounts were then taken, the liabilities of the business were paid out of his late employer's estate. The widow lent the firm £300, which had since been repaid, and the debtor provided another £50 capital. The debtor drew £200 per annum from the partnership, and his partner £100, and it was agreed that the net profits should be equally divided between them. In September, 1921, however, the partnership was dissolved, the business not being quite enough to support two partners, and his partner then retired on the receipt of £270, of which the debtor was compelled to borrow £100. He continued the business alone under the style of G. H. Wattson and Co., but it had scarcely paid expenses and he had found it necessary to borrow from friends to keep it going.

The meeting was closed and the case, which was a summary one, remained in the hands of the Official Receiver.

From Week to Week

THE BRITISH EMPIRE EXHIBITION, it is now officially announced, will be reopened in the first week in May.

POISONING BY CARBON MONOXIDE from the exhaust of a petrol engine resulted in the death of a Fulham chauffeur.

CONSIDERABLE DAMAGE was caused by fire at the Paddington Chemical Works, Paddington, near Warrington, on Saturday, January 3.

THE WILLARD GIBBS MEDAL for 1925 is to be awarded to Professor Moses Gomberg, of the Department of Organic Chemistry, University of Michigan.

SIR LIONEL PHILLIPS has resigned his seat on the board of the British Metal Corporation (Limited), and Sir Reginald Sothorn Holland has been elected a director in his place.

ITALY'S CHEMICAL PLANTS now number 1,000, involving over 100,000 workers and a paid-up capital of over half a million gold lire. The artificial silk industry is flourishing.

THE ANNUAL GENERAL MEETING of the Institute of Chemistry will be held on Monday, March 2. Nomination papers must be received at the office of the Institute before Monday, January 19.

A NEW LATEX DERIVATIVE to replace rubber cement has been produced. It is non-inflammable, because it contains water instead of volatile solvents, is stainless, and retains its original rubber qualities when applied.

GURNEY AND JACKSON, of 33, Paternoster Row, London, have been appointed official publishers to the Faraday Society, and in future they will deal with all business relating to the sale of transactions and separate reports of general discussions.

MR. CHARLES D. BLAKE, whose death is announced at the age of 86 at Newton Abbot, was chairman of Watts, Blake, Bearne and Co., Ltd., clay merchants, and a director of several other companies. Although blind for the past 16 years, he signed all his cheques and letters until a few hours before his death.

B.S.A. TOOLS, LTD., have arranged to give a public demonstration of automatically hardening their products in a Wild-Barfield electro-magnetic furnace at the Birmingham Corporation Electrical Showrooms (Industrial Section), 21, Paradise Street, Birmingham, on Monday, January 19, and continuing each day throughout the week.

THE ANNUAL DINNER of the Oil and Colour Chemists' Association, which in past years has followed the annual general meeting held in May, has been fixed for Friday, February 20, at the Holborn Restaurant. There will be no business meeting prior to the dinner, and it is hoped to make the occasion more of a social gathering than usual. It is expected that a number of well-known representative guests will be present.

AS A MARKET INDEX, British exporters should find useful the report just issued by the Department of Mines at Ottawa on the development of Canada's chemical, metallurgical and allied industries. It includes lists which show at once what raw materials are available and what materials must be imported. The report is obtainable from the High Commissioner for Canada, Kinnaird House, Pall Mall East, London, S.W.1.

A FACTORY for the extraction of sugar from beet will be built within the next nine months at Bury St. Edmunds by a company in which Tate and Lyle, the cane sugar refiners, will be associated with a group of Hungarian capitalists. The undertaking will cost about £350,000, half of which will be subscribed by the Hungarians who are helping to promote the scheme. When completed the factory will be capable either of extracting raw sugar from the beet or of carrying out the whole process and making refined sugar.

CONDITIONS IN THE GERMAN DYE INDUSTRY are not very satisfactory, according to a statement at a meeting of shareholders of the Farbenfabriken vorm. Friedrich Bayer und Co. at Leverkusen. Immediately after the war the empty foreign warehouses had to be filled, but a dead calm now reigned everywhere, partly owing to the elections. Stocks at the works had grown without ceasing. The bulk dated from the period of inflation, and therefore had not been very costly, but it would have to be liquidated as large sums of money were locked up in them. The number of workers and officials would also have to be reduced, and the pre-war strength of staffs was already being approached.

THE AMERICAN CELLULOSE AND CHEMICAL MANUFACTURING Co.'s factory at Maryland, Cumberland, has begun operations.

SIR MAX MUSPRATT contributed an interesting review of the chemical industry in 1924 to the *Liverpool Courier* of January 1.

THE DEATH IS ANNOUNCED of Mr. Alfred Long, who for over 46 years was connected with J. Crosfield and Sons, Ltd., soap manufacturers, of Warrington.

MR. J. E. BUDD has resigned his seat on the board of the British Copper Manufacturers, Ltd., and Mr. J. L. Siddall has been appointed a managing director.

S. BORNETT AND CO., LTD., 7-8, Idol Lane, Eastcheap, London, E.C.3, have been appointed sole agents for the Buffalo Foundry and Machine Co., of Buffalo, U.S.A.

FIRE DAMAGED THE PREMISES of Robartes (1922), Ltd., of Hazlitt House, Southampton Buildings, London, W.C., and also 19, Southampton Buildings, occupied by Mr. A. L. Mond, consulting chemist, on Saturday, January 3.

THE FIRST LEVERHULME SCHOLARSHIP for young chemists has been awarded by the Council of the Pharmaceutical Society to Mr. K. Malling, of Bolton; Mr. C. Forriday, of Northallerton; and Mr. T. C. Denston, of Derby.

MR. J. S. WILLIAMS-THOMAS, principal of the firm of Stevens and Williams, Ltd., glass manufacturers, of Brierley Hill, has been presented with a dressing case by the staff to record his completion of 61 years connection with the firm.

AFTER 68 YEARS' continuous service at the Weston Chemical Works, Mr. James Darlington, of Frodsham, has retired. In addition to granting him a pension, the management of the United Alkali Co. presented Mr. Darlington with £25 to mark the record association. Mr. Darlington is 78.

BROWN AND SON, of Alembic Works, Wedmore Street, Holloway, London, N.19, announce that the firm is now known as Brown and Son (Alembic Works), Ltd., with registered office at 9, Wedmore Street, Holloway, London, N.19. The directors of the newly registered company are:—Mr. Alfred Summers, Mr. R. Evans Smith and Mr. F. A. Easterbrook. Mr. R. D. Higgin is the secretary.

BRUNNER, MOND AND CO.'s first Irish representative, Mr. Walter A. Archibald, J.P., has died at Belfast. He first represented the firm in Ireland over forty years ago and was mainly responsible for building up an extensive business there. Mr. Archibald founded, and was the proprietor of, the Springfield Dyeing and Finishing Co., of Belfast. He was a well known public figure for nearly half a century.

IN RESPECT OF THE FIRE at the premises of George T. Holloway and Co., Ltd., 13, Emmett Street, Limehouse, London, E.14, we are informed by the firm that, although the main laboratory has been completely gutted, the testing and process plant is unaffected. Fortunately the smaller laboratories devoted to research work are also intact, and as these have now been made available for ordinary routine analytical and assay work the latter will not suffer any delay.

A COURSE OF TWELVE LECTURES on the physics and chemistry of paints, varnishes, and resins (natural and synthetic), with special reference to their colloidal properties, will be given by Mr. Alan A. Drummond, M.Sc., F.I.C., at the Battersea Polytechnic, Battersea Park Road, London, S.W.11, on Wednesdays, from 7.15 p.m., commencing January 14, 1925. The lecturer will deal more particularly with the application of advanced physics and chemistry to the methods for the preparation of materials used in the paint and colour industry. A further series of lectures and laboratory work on lubricating oils and greases will be given on Fridays at 7 p.m., commencing January 16, 1925.

THE REPORT OF THE PRELIMINARY INQUIRY, under the Boiler Explosions Act, into the explosion at the Stourton Chemical Works of Brotherton and Co., has now been published. The still from which the explosion occurred was one of four used in the distillation of cresylic acid and other carbolic products from crude carbolic acid. The report, which includes detailed diagrams of the stills and fittings, is of interest to all concerned with like processes. The explosion was found to be due to the frothing of the liquid in the still having closed all the outlets with pitch, and gas still being generated within the still, the pressure gradually increased until it was sufficient to cause the still to explode.

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SUGARS.—The extraction of lactose. C. Groud. *L'Ind. Chim.*, December, 1924, pp. 537-538.

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ANALYSIS.—The potentiometric estimation of alkaloids at the hydrogen electrode. F. Müller. *Z. Elektrochem.*, December, 1924, pp. 587-600.

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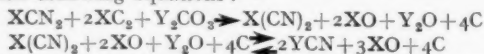
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Patent Literature

Abstracts of Complete Specifications

- 225,160. CYANIDES FROM ALKALINE EARTH CYANAMIDES, PROCESS FOR THE MANUFACTURE AND PRODUCTION OF. Fabriques de Produits Chimiques de Thann et de Mulhouse, Thann, Haut-Rhin, France. International Convention date, November 24, 1923.

An alkaline earth cyanamide is treated with a mixture of alkali carbonates and alkaline earth carbide to form a cyanide. The reaction may take place as low as 500° C., and the yield is nearly theoretical. The proportions employed are indicated by the following equations:—



X being the alkaline earth metal and Y the alkali metal. It is necessary to use perfectly dry materials, since the presence of water produces secondary reactions which liberate nitrogen or ammonia. The product is friable and porous, and the low temperatures employed do not damage the reaction vessels employed. At these temperatures, the cyanide is not sensitive to the oxidising action of the air, probably owing to the presence of the carbon.

The carbide enters into the reaction, and carbon also reacts to some extent directly with the cyanamide, so that somewhat smaller proportions of carbide may be employed without diminishing the yield. It is found that if the proportion of carbide be reduced to 75 per cent. of that indicated by the equations, the yield of cyanide is only 5 per cent. less. If iron is present, either as oxide or other compound, the cyanide is obtained in the form of prussiate, or if sulphur compounds are present sulphocyanides are obtained.

In an example, a mixture of dry calcium cyanamide with 19 per cent. nitrogen 17.8 parts, dry Solvay soda 13 parts, dry calcium carbide with 70 per cent. CaC_2 18.5 parts, is heated to 550° C. and then allowed to cool without special precautions. The product contains 21.8 per cent. of cyanide.

- 225,593. TITANIUM HYDROXIDE, PREPARATION OF. I. Blumenfeld and C. Weizmann, 16, Addison Crescent, London, W.14. Application date, July 31, 1923.

The object is to obtain titanium hydroxide by the hydrolytic treatment of solutions of titanium oxide in sulphuric acid. It has been found that the yield of titanium hydroxide by hydrolytic precipitation of such solutions and also the physical properties of the product depend not only on the final state of the solution before hydrolysis, but on certain transformations which it undergoes before and during precipitation. In this invention, the oxide or hydroxide is prepared by hydrolysis, by diffusion of titanium from one solution into another by differential concentration or temperature. The precipitation may be effected by this process in the presence of other substances such as barium sulphate, calcium sulphate, silica, etc.

In an example, a solution containing titanium oxide 180 parts, iron 42 parts, and sulphuric acid 460 parts is concentrated to half its volume when it becomes a crystalline paste. This mixture is introduced into twice its volume of boiling water in such a manner that the mixing is delayed from three to five minutes, so that immediate coagulation is avoided. The mixture is maintained at boiling point for half an hour, yielding 85–95 per cent. of titanium hydroxide.

- 225,595. SOAP, MANUFACTURE OF. E. V. Schou, Palsgaard, near Juelsminde, Denmark. Application date, August 2, 1923.

Oil-soluble gelatinated oils can be produced from fatty oils containing linolic, linolenic or linoleic acid by polymerisation or prolonged heating, which may be carried out with or without oxidation. These oils are "oil-soluble colloids," and if they are mixed with oils or melted fats which are to be mixed with an aqueous solution, the oil or fat is rendered capable of forming a stable water-in-oil emulsion. It has been found that the emulsion stabilising properties remain after the substances have been converted into water-soluble colloids by saponification. The presence of these substances in soap imparts to it special properties whether the oil-soluble colloid is added in such proportions that a water-in-oil emulsion is produced, or in such proportions that the usual

oil-in-water emulsion remains unaffected. If about 1 per cent. of the oil-soluble colloid is added during the soap manufacture, the colloidal or washing properties relatively to the alkali or alkaline salts of fatty acids are improved, or pure soaps may be produced with a reduced content of alkali.

In an example, refined soya oil is treated with air at 250° C. until gelatination sets in, or if simultaneous oxidation and polymerisation are not desired, superheated steam or an inert gas may be employed. The oil-soluble colloid is cooled to 100° C. and mixed with fresh oil when it is ready for use. Alternatively, the soya oil may be mixed with an oil not containing linolic, linoleic or linolenic acid, such as palm kernel or coconut oil before gelatination is effected, such addition remaining unaffected by the treatment. In the process of soap manufacture, about 1 per cent. of the oil-soluble colloid is added to the mixture shortly before completion of saponification, and the oil-in-water emulsion remains unaffected.

- 225,617. PETROLEUM EMULSIONS, PROCESS FOR TREATING. A. G. Bloxam, London. From W. S. Barnickel and Co., 937, Pacific Avenue, Webster Groves, St. Louis County, Mo., U.S.A. Application date, September 4, 1923.

It has been found that natural petroleum emulsions or those obtained in refining operations may have the components separated by means of substances derived from fatty acids, and which retain the fundamental characteristics of the fatty acids. Such substances include all substitution and addition products wherein the substituent group is present in the hydrocarbon radical, as well as esters and salts of such substitution or addition products. As examples, hydroxyl-, halogen-, sulfo-, nitro-, and amino-derivatives of fatty acids may be mentioned. The particular derivative of a fatty acid employed depends upon the nature of the emulsion to be treated. Substances which are particularly well adapted are the esters and sulphonates of fatty acids, the aromatic compounds of sulfo-fatty acids, sulphurised fatty acids, and the salts and esters of these. It is preferred to use the esters and aromatic compounds of sulfo-fatty acids, such as the phenol ester of sulfo-oleic acid, the sulfo-fatty acids such as sulfo-oleic acid, and the salts of these.

The emulsion to be treated is agitated with about 0.01–1 per cent. of one of these substances, until the emulsion breaks, and is then allowed to stand until it separates into an upper layer of oil and a lower layer of water or brine. In some cases the temperature during treatment may be 100° F. to 150° F., but heating is not necessary in the case of emulsions freshly produced from the ground.

- 225,678. DYES OF THE ANTHRAQUINONE SERIES. British Dyestuffs Corporation, Ltd., 70, Spring Gardens, Manchester, J. Baddiley, Crumpsall Vale Chemical Works, Blackley, Manchester, and W. W. Tatum, Dalton Works, Huddersfield. Application date, October 23, 1923. Addition to 201,610.

Specification 201,610 (see THE CHEMICAL AGE, Vol. IX, p. 264) describes the production of dyestuffs of the anthraquinone series by the condensation of amino derivatives of anthraquinone with the sulpho chloride of salicylic acid. In this invention it has been found that similar dyestuffs can be obtained by the use of sulpho chlorides of ortho-oxy-carboxylic acids in general. In an example, 1:4-diaminoanthraquinone is dissolved or suspended in hot acetic acid and the mixture cooled to 60° C. and then mixed with the sulpho chloride of ortho cresotinic acid. This is stirred at about 60° C. for 36 hours with the gradual addition of anhydrous sodium acetate. The dyestuff is filtered off and mixed with sodium carbonate to obtain the soluble sodium salt. This solution is bright red and is filtered off from any unaltered diamine and salted out. The dye gives bluish-red shades on wool and may also be used for dyeing acetate silk.

- 225,687. DISPERSAL OF MINERAL RAW MATERIALS BY CHEMICAL ACTION, PROCESS FOR. O. Reitnair, 66, Schulstrasse, Lang-Enzersdorf, Vienna. Application date, November 5, 1923.

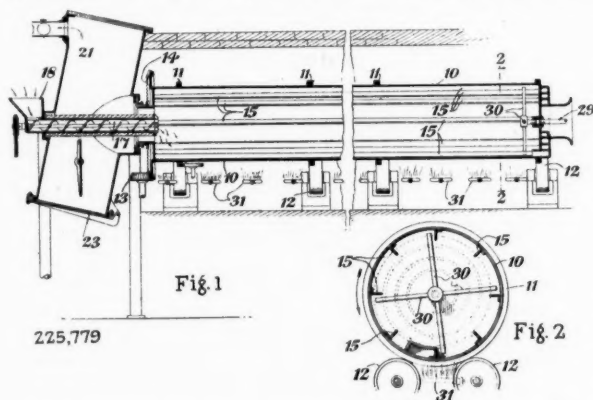
It has been found that many mineral raw materials which contain carbonates and considerable proportions of oxides,

hydrates, hydrosilicates, silicates, phosphates and fluoride may be disintegrated to a considerable extent by treating them with dilute solutions of acid salts so that substantially only the carbonates are decomposed, forming bicarbonates or hydrocarbonates. Mineral raw materials which have been subjected to mechanical grinding may also be treated by this method, and the fineness of the product is thus substantially increased.

The process is particularly applicable to minerals having more lime than magnesia, in which case it is possible to use dilute sulphuric acid or acid sulphates. Instead of sulphuric acid, another acid or acid salt and a sulphate may be used to ensure the formation of calcium sulphate. Thus, hydrochloric acid and sodium sulphate may be used, so that calcium and magnesium bicarbonates are formed. The calcium and magnesium chlorides, produced by the action of the hydrochloric acid on the carbonates, reacts with the sodium sulphate, yielding calcium and magnesium sulphates. The product is dry, and is readily mixed with various liquids, and the colours are brighter owing to the removal of calcium carbonate. An example is given in which finely sifted ochre containing calcium carbonate corresponding to 3 per cent. CO_2 is treated in a mixing apparatus with sulphuric acid of 20° Bé.

225,779. EXTRACTING INGREDIENTS FROM ORES AND OTHER MINERALS, PROCESS OF. E. E. Hedges, 40, East Kinney Street, Newark, N.J., U.S.A. Application date, May 26, 1924.

The valuable ingredients are extracted from ores by subjecting the ore in a finely sub-divided condition to the action



of superheated steam at a temperature above the vaporisation point of the ingredients to be extracted. The retort 10 is provided with ribs 11 to support it on rollers 12 so that it can be rotated by gearing 13, 14. The material is fed through a hopper 18 to a conveyor 17 and thence into the retort where it is lifted and dropped by longitudinal ribs 15. Superheated steam is admitted by a pipe 29 having branches 30, and burners 31 are provided to heat the retort to the necessary temperature, and the heating may be varied along the length of the retort. The volatilised ingredients are condensed in the chamber 21 and may be discharged through a door 23.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—212,865 (L. Lilienfeld), relating to the production of viscose, see Vol. X, p. 522; 213,575 (Metallbank und Metallurgische Ges. Akt.-Ges.) relating to the improvement of metals and alloys, see Vol. X, p. 47 (Metallurgical Section); 222,088 (F. Thaud and Soc. Electro-Metallurgique de Mont Richer) relating to production of magnetic steels with a high content of silicon, see Vol. X, p. 47 (Metallurgical Section).

LATEST NOTIFICATIONS.

- 226,767. Separation of fatty acids, resins, bitter and mucous substances from oils and fats. Wilhelm, K. F. December 24, 1923.
226,797. Manufacture of new dyestuffs. Society of Chemical Industry in Basle. December 28, 1923.
226,818. Process for bleaching oils, fats, and fatty acids. Naamlooze Vennootschap A. Jurgens' Margarinefabrieken. December 27, 1923.

622,819. Process of treating leucite and other potassium and sodium silicates with lime, for recovering potassium, sodium, and aluminium compounds. Jourdan, F. December 28, 1923.

226,822. Continuous process for the dehydration of volatile fatty acids. Soc. Anon. des Distilleries des Deux-Sevres (formerly Soc. Ricard, Allenet, et Cie.). December 28, 1923.

226,824. Manufacture of hydrogen cyanide. Deutsche Gold-und Silberscheideanstalt vorm. Roessler. December 2, 1922.

226,836. Rubber Vulcanisation. Dovon Chemical Corporation. December 29, 1923.

Specifications Accepted with Date of Application

213,266. Dyeing wool. Farbwerke vorm. Meister, Lucius and Brüning. March 19, 1923.

213,538. Solvent recovery plant. E. Geisel. January 31, 1924.

216,128. Elimination of iron from water. B. Deutsch and Ges. für Chemische Produktion. May 14, 1923.

226,581. Disintegrating ore and similar material, apparatus for. M. McGinness. August 25, 1923.

226,686. Arsenic and antimony compounds, Manufacture of. O. Y. Imray. (Farbwerke vorm. Meister, Lucius, and Brüning). January 16, 1924.

226,689. White lead, Production of. S. G. S. Dicker (L. A. Aars). January 22, 1924.

226,699. Cyanogen compounds, Method of production of. F. von Bichowsky and J. Harthan. February 13, 1924.

226,724. Fractionating of oil vapours. D. Pyzel. April 22, 1924.

226,731. Liquid fuels, Manufacture and production of. Badische Anilin & Soda Fabrik. January 14, 1924.

Applications for Patents

Burgess, Ledward, and Co., Ltd. Dyeing machines. 5. January 1.

Chemical Engineering and Wilton's Patent Furnace Co., Ltd., Wilton, T. O., and Wilton, N. Methods for dealing with effluent, etc., waste liquors and vapours. 230. January 3.

Donlan, T. Dyeing machines. 3. January 1.

Fabrique de Produits Chimiques, ci-devant Sandoz. Manufacture of trisazo dyestuffs. 92. January 1. (France, January 11, 1924.)

Pirbright Co., Ltd., Centrifuges, etc. 212. January 3.

Rogers, W. P. Manufacture of hydrogen. 95. January 1.

Wecker, E. Separating volatile substances from non-volatile substances. 82. January 1. (March 19, 1924.)

Death of Mr. A. Campbell

THE death is announced, in his 84th year, of Mr. Archibald Campbell, of Rugeley, who was for over 25 years manager of the Derby-Oxide and Colour Co., Ltd., of Rugeley from which position he had retired two years ago. Mr. Campbell began his career as a chemist in the works of Charles Tennant and Co., St. Rollox Works, Glasgow, and at an early age became an acquaintance of the late Dr. Ludwig Mond. In 1874 he left Glasgow to accept a position as chief chemist and assistant manager at a works belonging to the same firm on the Tyne. He remained there for five years, and during this period he acted as secretary to the Tyne Chemical Society, of which many well-known men in the chemical world were members. He was afterwards connected with the Runcorn Soap and Alkali Co., and later took over the management of a works at Southampton, carrying on the manufacture of sulphuric acid, sulphate of alumina, tar distillation, etc. He afterwards was associated with an American firm, which was endeavouring to make bleaching powder by the Weldon process, but had not been very successful. Mr. Campbell accepted an offer of this firm to control their works in Erie, Pennsylvania, but the process he went out to develop was very soon superseded by an electrolytic process. It was while in America that Mr. Campbell received an offer by cablegram to take over the managementship of the Derby-Oxide and Colour Co., Ltd., at Rugeley, and he commenced his duties there in 1897.

Exhibition of Scientific Instruments

THE annual exhibition of scientific apparatus opened at the Imperial College of Science on Wednesday last.

Exhibitors included the Chromoscope Company, who displayed the mutochrome by means of which an artist developing a colour design for printed or woven fabric is able to see his scheme as a whole. Each element in the design can be varied independently in colour and brightness and the instrument is thus of considerable value for experimental purposes. The Cambridge Instrument Co. showed a recording accelerometer for measuring the acceleration of motor vehicles and aeroplanes.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firm's independent and impartial opinions.

London, January 8, 1925.

THE general demand is slowly regaining strength after the holidays and stocktaking. The outlook for the new year is quite bright and the volume of trade seems likely to move in an upward direction.

Export inquiry is fairly active, but many of the overseas limits are too low.

General Chemicals

ACETONE is in steady demand at about £85 to £87 per ton.

ACID ACETIC.—The quantities arriving are steadily absorbed, the price for technical being £41 per ton, and for pure £43 per ton for 80% grade.

ACID CITRIC is a little firmer in price, rather more inquiry being evident.

ACID FORMIC is in good demand at £52 to £53 per ton.

ACID LACTIC is unchanged at about £43 per ton for 50% by weight.

ACID OXALIC is in good inquiry. A fair business is passing, and the price tends upwards.

ACID TARTARIC.—There is rather more inquiry, but little actual business is in evidence.

ALUMINA SULPHATE.—Although there is no change in price, suppliers might be tempted by a bid if a substantial tonnage were involved.

ARSENIC maintains its firmer tendency, although only a moderate business is passing.

BARIUM CHLORIDE is in fair inquiry, the price being about £12 per ton.

COPPER SULPHATE is unchanged.

CREAM OF TARTAR.—The upward tendency has been arrested; makers are looking for higher prices. The market to-day is about £78 per ton.

FORMALDEHYDE is in slow demand and the price unchanged at about £47 per ton.

EPSOM SALTS.—Very firm; price likely to advance.

LEAD ACETATE.—This article has not advanced to the full extent of the limit in lead. If the price of lead is maintained, higher prices for acetate may be expected before long.

LEAD NITRATE is very firm indeed, for much the same reason.

LIME ACETATE is quiet at about £13 10s. to £14 per ton.

METHYL ALCOHOL is unchanged at about £52 to £53 per ton.

POTASSIUM CARBONATE AND CAUSTIC.—Unchanged.

POTASSIUM PERMANGANATE.—Price is firm and stocks are nominal. To-day's figure is about 8d. to 8½d. per lb.

POTASSIUM PRUSSATE is a firm market at 7½d. to 8d. per lb.

SODIUM ACETATE is unchanged at £23 to £23 10s. per ton.

SODIUM BICHROMATE.—American makers have advanced their price in sympathy with the advance in sterling.

SODIUM HYPOSULPHITE is unchanged at £9 10s. to £9 15s. per ton.

SODIUM PRUSSATE is inquired for on both home trade and export account; the price seems likely to improve.

SODIUM SULPHIDE.—The tendency is still in buyers' favour.

Coal Tar Products

The market generally in coal tar products shows little change from last week, and the firm tone is maintained.

90% BENZOL is steady at 1s. 8d. to 1s. 8½d. per gallon on rails.

PURE BENZOL is quoted at 2s. per gallon on rails.

CREOSOTE OIL is very firm, and is quoted at 6½d. to 6¾d. per gallon on rails in the North, while the price in London is from 6½d. to 6¾d. per gallon.

CRESYLIC ACID is quoted at 1s. 11d. to 2s. per gallon on rails for the Pale quality 97/99%, while the Dark quality 95/97% is quoted at 1s. 7d. to 1s. 8d. per gallon on rails.

SOLVENT NAPHTHA is quietly steady at 1s. 3½d. to 1s. 4d. per gallon on rails.

HEAVY NAPHTHA is quoted at 1s. to 1s. 1d. per gallon on rails.

NAPHTHALENES have a slightly better inquiry, but prices remain unchanged. The drained qualities are worth from £4 to £4 10s. per ton, with the 76/78 quality at £6 to £6 10s., and 74/76 quality at £5 10s. to £6 per ton.

PITCH.—The market remains quiet. Values are unchanged, namely, 50s. to 52s. 6d. f.o.b. East Coast ports.

Nitrogen Products Market

Export.—During the last week there has been a continuous demand from the Far East and from one or two other countries, and the tendency is for the market to be firmer. Sales for export for delivery up to the end of April have reduced to narrow limits the further quantities available for near delivery. It is expected that the bulk of the supplies available will be disposed of at about £13 15s. per ton f.o.b. with perhaps a slightly higher figure for February–April shipment. Again, there have been inquiries from the United States, but as a tariff operates against sulphate of ammonia it is quite possible that no business will result.

Home.—Home sales have been normal for this period of the year. Many buyers have booked their quantities for delivery up to the end of May and all the indications are for a large increase on last year's home demand. The producers have reserved large quantities to meet home requirements, but an excessive demand may result in those who order too late being unable to secure delivery.

Nitrate of Soda.—The nitrate of soda market continues quiet and practically no sales have been reported by the Producers' Association. The business done is mostly for resale at the price of about £11 15s. per ton for prompt delivery with slightly higher prices for early spring delivery.

American Market Movements

(From Drug and Chemical Markets.)

BUSINESS in industrial chemicals reported at standstill in practically all quarters. Domestic prussiates advanced. Barium products cut further. Potassium perchlorate obtainable at 10½c. lb. Potash higher. Calcium arsenate continues quiet. Copper sulphate firm. Orders for immediate delivery of intermediates reported rare. Para-toluidine shaded in some quarters. Dimethylaniline lower. Beta-naphthol develops strong undertone. Ortho-toluidine in active spot demand. Crudes remain quiet. Pyridine market very weak. Phenol fairly steady. Naphthalene holding firm. Cresol quiet. Cresylic acid dull.

Linseed oil at recent levels after rise in price. Vegetable oils holding firm. Chinawood oil quiet and shaded in some quarters. Palm oil dull on spot. Rapeseed oil steady. Animal oils remain in very firm positions with demand greater than available supply. Fish oils quiet but steady.

Fine chemicals are generally quiet with exception of mercury, codliver oil, and alcohol. Saccharin is lower. Silicylates are steady. Bromides are quiet.

Dyestuffs Licences for December

THE following statement relating to applications for licences under the Dyestuffs (Import Regulation) Act, 1920, made during December has been furnished to the Board of Trade by the Dyestuffs Advisory Licensing Committee:—The total number of applications received during the month was 369, of which 329 were from merchants or importers. To these should be added 35 cases outstanding on December 1, making a total for the month of 404. These were dealt with as follows: Granted, 304 (of which 268 were dealt with within seven days of receipt); referred to British makers of similar products, 62 (of which 45 were dealt with within seven days of receipt); referred to Reparation Supplies available, 25 (all dealt with within two days of receipt); outstanding on December 31, 1924, 13. Of the total of 404 applications received, 338, or 84 per cent., were dealt with within seven days of receipt.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at retailers' works.

General Heavy Chemicals

Acid Acetic, 40% Tech.—£22 to £24 per ton.
 Acid Boric, Commercial.—Crystal, £45 per ton, Powder, £47 per ton.
 Acid Hydrochloric.—3s. 9d. to 6s. per carboy d/d., according to purity, strength and locality.
 Acid Nitric, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.
 Acid Sulphuric.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 65s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
 Ammonia Alkali.—£6 15s. per ton f.o.r. Special terms for contracts.
 Bleaching Powder.—Spot, £10 10s. d/d.; Contract, £10 d/d. 4 ton lots.
 Bisulphite of Lime.—£7 10s. per ton, packages extra.
 Borax, Commercial.—Crystal, £25 per ton. Powder, £26 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)
 Calcium Chloride (Solid).—£5 12s. 6d. to £5 17s. 6d. per ton d/d, carriage paid.
 Copper Sulphate.—£25 per ton.
 Methylated Spirit 64 O.P.—Industrial, 2s. 7d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.
 Nickel Sulphate.—£38 per ton d/d. Normal business.
 Nickel Ammonia Sulphate.—£38 per ton d/d. Normal business.
 Potash Caustic.—£30 to £33 per ton.
 Potassium Bichromate.—5½d. per lb.
 Potassium Chlorate.—3d. to 4d. per lb.
 Sal ammoniac.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton. Carr. pd.
 Salt Cake.—£3 10s. per ton d/d. In bulk.
 Soda Caustic, Solid.—Spot lots delivered, £15 12s. 6d. to £18 per ton, according to strength; 20s. less for contracts.
 Soda Crystals.—£5 to £5 5s. per ton ex railway depots or ports.
 Sodium Acetate 97/98%.—£24 per ton.
 Sodium Bicarbonate.—£10 10s. per ton, carr. paid.
 Sodium Bichromate.—4½d. per lb.
 Sodium Bisulphite Powder 60/62%.—£17 to £18 per ton, according to quantity, f.o.b., 1-cwt. iron drums included.
 Sodium Chlorate.—2½d. to 3½d. per lb.
 Sodium Nitrate refined 96%.—£13 5s. to £13 10s. per ton, ex Liverpool. Nominal.
 Sodium Nitrite 100% basis.—£27 per ton d/d.
 Sodium Sulphide conc. solid. 60/65.—About £15 per ton d/d. Contract £14 15s. Carr. pd.
 Sodium Sulphide Crystals.—£9 5s. per ton d/d. Contract £9 2s. 6d. Carr. pd.
 Sodium Sulphide, Pea Crystals.—£15 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

Acid Carbollic Crystals.—5½d. per lb. Quiet. Crude 60's, 1s. 7d. to 1s. 9d. per gall. Market quiet.
 Acid Cresylic 97/99.—1s. 11d. to 2s. 1d. per gall. Market weaker.
 Pale, 95%, 1s. 7d. to 1s. 11d. per gall. Dark, 1s. 7d. to 1s. 9d. per gall. Market dull.
 Anthracene Paste 40%.—4d. per unit per cwt.—Nominal price. No business.
 Anthracene Oil, Strained.—6½d. to 7½d. per gall. Small demand. Unstrained, 6d. to 6½d. per gall.
 Benzol.—Crude 65's.—9d. to 11½d. per gall., ex works in tank wagons. Standard Motor, 1s. 4½d. to 1s. 6d. per gall., ex works in tank wagons. Pure, 1s. 9½d. to 1s. 11d. per gall., ex works in tank wagons. Prices advanced. Supplies very scarce.
 Toluol.—90%, 1s. 5½d. to 1s. 7d. per gall. More inquiry. Pure, 1s. 7d. to 1s. 9d. per gall. Steady demand.
 Xylol Commercial.—2s. 3d. per gall. Pure, 3s. 3d. per gall.
 Creosote.—Cresylic, 20/24%, 8½d. to 8½d. per gall. Not much business. Middle Oil, Heavy, Standard specification, 5½d. to 6½d. per gall., according to quality and district. Market firmer. Steady demand.
 Naphtha.—Crude, 8d. to 9d. per gall. Solvent 90/160, 1s. 5d. to 1s. 7d. per gall. Demand good. Solvent 90/190, 1s. to 1s. 1d. per gall. Rather more inquiry.
 Naphthalene Crude.—Demand rather better. Cheaper in Yorkshire than in Lancashire. Drained Creosote Salts, £3 to £5 per ton. Steady, but quiet. Whizzed or hot pressed, £6 to £9 per ton. No business.
 Naphthalene.—Crystals and Flaked, £12 to £15 per ton, according to districts.
 Pitch.—Medium soft, 47s. 6d. to 55s. per ton, according to district. Not much business. Demand anticipated.
 Pyridine.—90/160, 18s. to 18s. 6d. per gall. Fair inquiries. Heavy, 11s. 6d. to 12s. Steady.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated.

Acetic Anhydride 95%.—1s. 7d. per lb.
 Acid H.—3s. 10d. per lb. 100% basis d/d.
 Acid Naphthionic.—2s. 2d. per lb. 100% basis d/d.
 Acid Neville and Winther.—5s. 8d. per lb. 100% basis d/d.
 Acid Salicylic, technical.—1s. 1d. per lb. Good demand.
 Acid Sulphanilic.—9d. per lb. 100% basis d/d.
 Aluminium Chloride, anhydrous.—10d. per lb. d/d.
 Aniline Oil.—8d. per lb. naked at works.
 Aniline Salts.—8d. per lb. naked at works.
 Antimony Pentachloride.—1s. per lb. d/d.
 Benzidine Base.—3s. 9d. per lb. 100% basis d/d.
 Benzyl Chloride 95%.—1s. 1d. per lb.
 p-Chlorophenol.—4s. 3d. per lb. d/d.
 p-Chloraniline.—3s. per lb. 100% basis.
 o-Cresol 29/31° C.—3½d. to 4½d. per lb. Easier.
 m-Cresol 98/100%.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
 p-Cresol 32/34° C.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
 Dichloraniline.—2s. 3d. per lb.
 Dichloraniline S. Acid.—2s. 3d. per lb. 100% basis.
 Diethylbenzol.—£85 per ton.
 Diethylaniline.—4s. 3d. per lb. d/d., packages extra, returnable.
 Dimethylaniline.—2s. 2½d. per lb. d/d. Drums extra.
 Dinitrobenzene.—9d. per lb. naked at works.
 Dinitrochlorbenzol.—£84 10s. per ton d/d.
 Dinitrotoluene.—48/50° C. 8d. to 9d. per lb. naked at works.
 66/68° C. 1s. 2d. per lb. naked at works.
 Diphenylaniline.—2s. 10d. per lb. d/d.
 G. Salt.—2s. 2d. per lb. 100% basis d/d.
 Monochlorbenzol.—£63 per ton.
 a-Naphthol.—2s. 4d. per lb. d/d.
 B-Naphthol.—1s. per lb. d/d.
 a-Naphthylamine.—1s. 3½d. per lb. d/d.
 B-Naphthylamine.—4s. per lb. d/d.
 m-Nitraniline.—4s. 2½d. per lb. d/d.
 p-Nitraniline.—2s. 2½d. per lb. d/d.
 Nitrobenzene.—5½d. to 5½d. per lb. naked at works.
 o-Nitrochlorbenzol.—2s. 3d. per lb. 100% basis d/d.
 Nitronaphthalene.—10d. per lb. d/d.
 p-Nitrophenol.—1s. 9d. per lb. 100% basis d/d.
 p-Nitro-o-amido-phenol.—4s. 6d. per lb. 100% basis.
 m-Phenylene Diamine.—4s. per lb. d/d.
 p-Phenylene Diamine.—10s. per lb. 100% basis d/d.
 R. Salt.—2s. 4d. per lb. 100% basis d/d.
 Sodium Naphthionate.—2s. 2d. per lb. 100% basis d/d.
 o-Toluidine.—10d. per lb.
 p-Toluidine.—2s. 10d. per lb. naked at works.
 m-Tolylene Diamine.—4s. per lb. d/d.

Wood Distillation Products

Market quiet, American competition still fairly keen.
 Acetate of Lime.—Brown £11 to £11 5s. per ton d/d and upward.
 Quiet market. Grey, £15 to £15 10s. per ton. Firmer. Liquor, 9d. per gall. 32° Tw.
 Charcoal.—£7 5s. to £9 per ton, according to grade and locality. Fair demand.
 Iron Liquor.—1s. 7d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.
 Red Liquor.—10d. to 1s. per gall. 14/15° Tw.
 Wood Creosote.—2s. 9d. per gall. Unrefined.
 Wood Naphtha, Miscible.—4s. 9d. per gall. 60% O.P. Solvent, 5s. per gall. 40% O.P.
 Wood Tar.—£3 5s. to £4 per ton. Demand slack and stocks being held.
 Brown Sugar of Lead.—£44 per ton. Steady market.

Rubber Chemicals

Antimony Sulphide.—Golden, 5½d. to 1s. 4d. per lb., according to quality. Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.
 Arsenic Sulphide, Yellow.—1s. 11d. per lb.
 Barytes.—£3 10s. to £6 15s. per ton, according to quality.
 Cadmium Sulphide.—3s. 9d. to 4s. 3d. per lb., according to quantity.
 Carbon Bisulphide.—£30 to £33 per ton, according to quantity.
 Carbon Black.—6d. to 6½d. per lb., ex wharf.
 Carbon Tetrachloride.—£62 10s. to £67 10s. per ton, according to quantity drums extra.
 Chromium Oxide, Green.—1s. 3d. per lb.
 Indiarubber Substitutes, White and Dark.—5d. to 9½d. per lb. Demand very brisk. Prices likely to remain steady owing to firmness of rapeseed oils.
 Lamp Black.—£48 per ton, barrels free.
 Lead Hyposulphite.—7½d. per lb.
 Lithopone, 30%.—£22 10s. per ton.

Mineral Rubber "Rubpron."—£16 5s. per ton f.o.r. London.
 Sulphur.—£10 to £12 per ton, according to quality.
 Sulphur Chloride.—4d. per lb., carboys extra.
 Sulphur Precip. B.P.—£56 to £65 per ton.
 Thiocarbonyl.—2s. 6d. per lb.
 Vermilion, Pale or Deep.—5s. per lb. Dearer.
 Zinc Sulphide.—7½d. to 1s. 8d. per lb., according to quality.

Pharmaceutical and Photographic Chemicals

Acid, Acetic 80% B.P.—£45 per ton ex wharf London in glass containers.
 Acid, Acetyl Salicylic.—2s. 11d. to 3s. 1d. per lb., according to quantity. Sales steady. Price firm.
 Acid, Benzoic B.P.—2s. 6d. per lb.
 Acid, Boric B.P.—Crystal £51 per ton, Powder £55 per ton. Carriage paid any station in Great Britain.
 Acid, Camphoric.—19s. to 21s. per lb.
 Acid, Citric.—1s. 4½d. to 1s. 5d. per lb., less 5% for ton lots. Increased demand.
 Acid, Gallic.—2s. 9d. per lb. for pure crystal, in cwt. lots. Easier.
 Acid, Pyrogallic, Crystals.—7s. per lb. for 1 cwt. lots. Resublimed quality 8s. per lb. Market firm.
 Acid, Salicylic.—1s. 5½d. to 1s. 6d. per lb., according to quantity.
 Acid, Tannic B.P.—2s. 10d. per lb. Quiet steady demand.
 Acid, Tartaric.—1s. 1d. per lb., less 5%.
 Amidol.—9s. per lb., d/d.
 Acetanilide.—1s. 10d. to 2s. per lb. More inquiry.
 Amidopyrin.—14s. 6d. per lb. for spot stocks.
 Ammonium Benzoate.—3s. to 3s. 3d. per lb., according to quantity.
 Ammonium Carbonate B.P.—£37 per ton.
 Atropine Sulphate.—12s. 6d. per oz. for English make.
 Barbitone.—13s. 9d. per lb. Slightly lower. Quiet steady demand.
 Benzonaphthol.—5s. 3d. per lb. spot.
 Bismuth Salts.—Prices reduced by about 1s. 3d. to 2s. 3d. per lb. on account of the fall in the price of the metal.
 Bismuth Carbonate.—7s. 8d. to 9s. 8d. per lb.
 Bismuth Citrate.—8s. to 10s. per lb.
 Bismuth Salicylate.—7s. 5d. to 9s. 5d. per lb.
 Bismuth Subnitrate.—6s. 10d. to 8s. 10d. per lb. according to quantity. Prices again reduced.
 Borax B.P.—Crystal £29, Powder £30 per ton. Carriage paid any station in Great Britain.
 Bromides.—Potassium, 1s. 10d. per lb.; sodium, 1s. 11d. per lb.; ammonium, 2s. 1d. per lb. Market less firm. Prices uncertain.
 Calcium Lactate.—1s. 7d. to 2s., according to quantity. Fair demand and steady market.
 Chloral Hydrate.—4s. per lb.
 Chloroform.—2s. 6d. per lb. for cwt. lots.
 Creosote Carbonate.—6s. 6d. per lb. Little demand.
 Formaldehyde.—£48 to £49 per ton, in barrels ex wharf London. Supplies exceed demand.
 Glycerophosphates.—Fair business passing. Calcium, soluble and citrate free, 7s. per lb.; iron, 8s. 9d. per lb.; magnesium, 9s. per lb.; potassium, 50%, 3s. 6d. per lb.; sodium, 50%, 2s. 6d. per lb.
 Guaiaac Carbonate.—9s. per lb. Reduced in price.
 Hexamine.—3s. per lb. For bold crystal. Powder slightly less.
 Homatropine Hydrobromide.—25s. to 30s. per oz.
 Hydrastine Hydrochloride.—English make offered at 120s per oz.
 Hydroquinone.—4s. 3d. per lb. in cwt. lots. Foreign make.
 Hypophosphites.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
 Iron Ammonium Citrate B.P.—1s. 11d. to 2s. 3d. per lb. Prices recently reduced.
 Magnesium Carbonate.—Light Commercial, £36 per ton net. Light pure, £46 per ton.
 Magnesium Oxide.—Light Commercial, £75 per ton, less 2½%; Heavy Commercial, £25 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity. Steady market.
 Menthol.—A.B.R. recrystallised B.P., 55s. per lb., Synthetic, 26s. to 35s. per lb. according to quality. English make. Increasing demand.
 Mercurials.—Market very quiet. Red oxide, 5s. 2d. to 5s. 4d. per lb.; Corrosive sublimate, 3s. 5d. to 3s. 7d. per lb.; white precipitate, 4s. 6d. to 4s. 8d. per lb.; Calomel, 3s. 10d. to 4s. per lb.
 Methyl Salicylate.—1s. 9d. to 2s. per lb.
 Methyl Sulphonel.—22s. per lb. Slightly weaker.
 Metol.—11s. per lb. British make.
 Morphine and Salts.—Reduced by 1s. to 1s. 3d. per oz.
 Paraformaldehyde.—2s. 8d. for B.P. quality.
 Paraldehyde.—1s. 2d. to 1s. 6d. per lb., in free bottles and cases.
 Phenacetin.—5s. 3d. per lb. in cwt. lots.
 Phenazone.—7s. per lb.
 Phenolphthalein.—5s. 4d. per lb. for cwt. lots.
 Potassium Bitartrate 99/100% (Cream of Tartar).—86s. per cwt., less 2½% for ton lots.
 Potassium Citrate.—1s. 10d. to 2s. 2d. per lb.
 Potassium Ferricyanide.—1s. 9d. per lb. Quiet.
 Potassium Iodide.—16s. 8d. to 17s. 5d. per lb., according to quantity. Steady market.

Potassium Metabisulphite.—7½d. per lb., 1-cwt. kegs included, f.o.r. London.
 Potassium Permanganate.—B.P. crystals, 7½d. per lb., carriage paid; commercial, 8d. to 8½d. per lb., carriage paid. Forward prices higher.
 Quinine Sulphate.—2s. 3d. to 2s. 4d. per oz., in 100 oz. tins. Steady market.
 Resorcin.—5s. per lb. In fair quantities. Supplies exceed demand.
 Saccharin.—63s. per lb. in 50-lb. lots.
 Salol.—3s. 6d. per lb., for cwt. lots. Slightly dearer.
 Silver Proteinate.—9s. per lb. for satisfactory product light in colour.
 Sodium Benzoate, B.P.—2s. 6d. per lb. Supplies of good quality available.
 Sodium Citrate, B.P.C., 1923.—1s. 11d. to 2s. 2d. per lb., according to quantity.
 Sodium Hypophosphite, Photographic.—£13 to £15 per ton, according to quantity, d/d consignee's station in 1-cwt. kegs.
 Sodium Metabisulphite Crystals.—37s. 6d. to 60s. per cwt., net cash, according to quantity.
 Sodium Nitroprusside.—16s. per lb.
 Sodium Potassium Tartrate (Rochelle Salt).—75s. per cwt., for ton lots and upwards.
 Sodium Salicylate. Powder, 2s. 3d. to 2s. 5d. per lb. Crystal, 2s. 4d. to 2s. 6d. per lb. Flake, 2s. 6d. per lb. Strong demand, market firmer. Prices advancing.
 Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb.
 Sodium Sulphite, anhydrous, £27 10s. per ton, minimum 5 ton lots, according to quantity; 1 cwt. kegs included.
 Sulphonal.—14s. 6d. per lb. Little demand.
 Thymol.—18s. per lb. Firmer market.

Perfumery Chemicals

Acetophenone.—11s. per lb.
 Aubepine.—12s. 6d. per lb.
 Amyl Acetate.—3s. per lb.
 Amyl Butyrate.—6s. 6d. per lb.
 Amyl Salicylate.—3s. 3d. per lb.
 Anethol (M.P. 21/22° C.).—4s. 6d. per lb.
 Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s. 9d. per lb.
 Benzyl Alcohol free from Chlorine.—2s. 9d. per lb.
 Benzaldehyde free from Chlorine.—2s. 9d. per lb.
 Benzyl Benzoate.—3s. 6d. per lb.
 Cinnamic Aldehyde Natural.—18s. 6d. per lb.
 Coumarin.—17s. per lb.
 Citronellol.—20s. per lb.
 Citral.—9s. per lb.
 Ethyl Cinnamate.—12s. 6d. per lb.
 Ethyl Phthalate.—3s. per lb.
 Eugenol.—10s. 6d. per lb.
 Geraniol (Palmarosa).—33s. 6d. per lb.
 Geraniol.—12s. 6d. to 20s. per lb.
 Heliotropine.—6s. 9d. per lb.
 Iso Eugenol.—16s. per lb.
 Linalol ex Bois de Rose.—26s. per lb.
 Linalyl Acetate.—26s. per lb.
 Methyl Anthranilate.—10s. per lb.
 Methyl Benzoate.—5s. per lb.
 Musk Ambrette.—50s. per lb.
 Musk Xylol.—14s. per lb.
 Nerolin.—4s. 6d. per lb.
 Phenyl Ethyl Acetate.—15s. 6d. per lb.
 Phenyl Ethyl Alcohol.—14s. 3d. per lb. Cheaper.
 Rhodinol.—50s. per lb.
 Safrol.—1s. 10d. per lb.
 Terpineol.—2s. 4d. per lb.
 Vanillin.—25s. to 25s. 6d. per lb.

Essential Oils

Almond Oil, Foreign S.P.A.—15s. 6d. per lb.
 Anise Oil.—2s. 10d. per lb.
 Bergamot Oil.—15s. per lb.
 Bourbon Geranium Oil.—30s. per lb.
 Camphor Oil.—65s. per cwt.
 Cananga Oil, Java.—11s. 3d. per lb.
 Cinnamon Oil, Leaf.—6½d. per oz.
 Cassia Oil, 80/85%.—9s. per lb.
 Citronella Oil.—Java, 85/90%, 7s. per lb. Ceylon, 3s. 2d. per lb. Cheaper.
 Clove Oil.—8s. per lb. Cheaper.
 Eucalyptus Oil, 70/75%.—2s. 1d. per lb.
 Lavender Oil.—French 38/40% Esters, 35s. per lb.
 Lemon Oil.—3s. 4d. per lb.
 Lemongrass Oil.—5s. 9d. per lb.
 Orange Oil, Sweet.—10s. 9d. per lb. Cheaper.
 Otto of Rose Oil.—Bulgarian, 42s. 6d. per oz. Anatolian, 28s. per oz.
 Palma Rosa Oil.—17s. per lb.
 Peppermint Oil.—Wayne County, 45s. per lb. Japanese, 22s. 6d. per lb.
 Petitgrain Oil.—9s. 9d. per lb.
 Sandal Wood Oil.—Mysore, 26s. 7d. per lb. Australian, 18s. 6d. per lb.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, January 8, 1925.

THE holiday has somewhat interfered with business during the past week, but since the re-start inquiry on the whole has been good. Prices for both Home and Continental products remain steady.

Industrial Chemicals

ACID ACETIC.—In moderate demand and prices steady. Glacial 98/100%, £57 to £68 per ton, according to quality and packing; 80% pure quoted £43 to £45 per ton; 80% technical, £42 to £44 per ton, packed in casks delivered c.i.f. U.K. port, duty free.

ACID BORACIC.—Remains unchanged. Crystal or granulated, £45 per ton; powdered, £47 per ton, carriage paid U.K. stations, minimum ton lots.

ACID CARBOLIC, ICE CRYSTALS.—Unchanged at about 5½d. per lb., delivered, but demand rather poor and could probably be obtained for less.

ACID CITRIC, B.P. CRYSTALS.—In moderate demand and price steady at 1s. 4½d. per lb., less 5% ex store. Offered for prompt shipment from the continent at 1s. 4½d. per lb., less 5%, ex wharf.

ACID FORMIC, 85%.—Quoted £52 10s. per ton, ex store, spot delivery. Offered from the continent at about £50 per ton, c.i.f. U.K. port.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC, 80%.—£23 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Rather better inquiry and price maintained at about 3½d. per lb., ex store. Offered from the continent at 3½d. per lb., ex wharf.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—In little demand, quoted 11½d. per lb., less 5%, ex store. Offered for forward delivery at about the same figure.

ALUMINA SULPHATE, 17/18% IRON FREE.—Rather cheaper quotations from the continent. Now quoted £6 10s. per ton, c.i.f. U.K. port, prompt shipment. Spot lots quoted £7 5s. per ton, ex store.

ALUM.—Lump potash alum unchanged at about £9 15s. per ton, ex store, spot delivery. Offered from the continent at about £8 15s. per ton, ex wharf. Ammonium chrome alum of British manufacture quoted £17 per ton, f.o.b. U.K. port.

AMMONIA ANHYDROUS.—Unchanged at about 1s. 6d. per lb., ex station. Containers extra and returnable, with possible slight reduction for large quantities.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton; packed in 5 cwt. casks, delivered U.K. port.

AMMONIA, LIQUID, 88%.—In steady demand. Unchanged at 2½d. to 3d. per lb., delivered, according to quantity; containers extra.

AMMONIA MURIATE.—Grey galvanizer's crystals of English manufacture, unchanged at about £30 per ton in casks, £29 per ton in bags, carriage paid U.K. stations. Fine white crystals offered from the continent at about £23 10s. per ton, c.i.f. U.K. port.

ARSENIC, WHITE POWDERED.—Moderate inquiry and price unchanged at about £36 per ton, ex wharf, early delivery. Spot lots quoted £37 per ton, ex store.

BARIUM CARBONATE, 98/100%.—Offered from the continent at about £9 10s. per ton, c.i.f. U.K. port.

BARIUM CHLORIDE, 98/100%.—Unchanged at about £12 5s. per ton, ex store; 93/95% quality offered from the continent at £9 10s. per ton, c.i.f. U.K. port.

BLEACHING POWDER.—Spot lots quoted £10 10s. per ton, ex station. Contracts 20s. per ton less.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. port.

BORAX.—Granulated, £24 10s. per ton; crystals, £25 per ton; powdered, £26 per ton, carriage paid U.K. stations, minimum ton lots.

CALCIUM CHLORIDE.—Price for English material unchanged at £5 12s. 6d. per ton, ex station. Continental cheaper at about £4 7s. 6d. per ton, c.i.f. U.K. port.

COPPERAS, GREEN.—Unchanged at about £3 5s. per ton, ex works, packed in casks, free.

COPPER SULPHATE.—In little demand. British material for export quoted about £24 10s. per ton, f.o.b. U.K. port. Continental available on spot at about £23 10s. per ton, ex store.

FORMALDEHYDE, 40%.—Nominally £48 per ton, ex store, spot delivery. In little demand.

GLAUBER SALTS.—White crystals of English manufacture unchanged at £4 per ton, ex store or station. Fine white crystals offered from the continent at £3 5s. per ton, c.i.f. U.K. port.

LEAD, RED.—Imported material quoted £48 per ton, ex store, but some parcels could probably be picked up for less.

LEAD, WHITE.—Unchanged at about £48 15s. per ton, ex store.

LEAD, ACETATE.—White crystals unchanged at about £48 per ton, ex store, spot delivery. Brown quoted £46 10s. per ton, ex store.

MAGNESITE, CALCINED.—Unchanged at about £7 17s. 6d. per ton, ex station, prompt delivery. Hard burnt quality quoted £4 15s. per ton, ex station. Finer quality of continental manufacture quoted £7 15s. per ton, c.i.f. U.K. port.

MAGNESIUM CHLORIDE.—Offered from the continent at £4 15s. per ton, c.i.f. U.K. port.

POTASH, CAUSTIC, 88/92%.—Unchanged at about £31 per ton, ex wharf, prompt shipment from the continent.

POTASSIUM BICHROMATE.—Quoted 5d. per lb. delivered.

POTASSIUM CARBONATE, 96/98%.—Unchanged at about £23 per ton, c.i.f. U.K. port. Spot material on offer at £24 15s. per ton, ex store.

POTASSIUM CHLORATE.—Quoted 2½d. per lb., c.i.f. U.K. port, prompt shipment. Spot lots available at about 2½d. per lb., ex wharf.

POTASSIUM NITRATE, SALTPETRE.—Quoted £26 per ton, c.i.f. U.K. port, prompt shipment from the continent. Spot lots on offer at £28 15s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Unchanged at about 8½d. per lb., ex store, spot delivery. Offered from the continent at about 8½d. per lb. ex wharf.

POTASSIUM PRUSSIAN, YELLOW.—Offered for early delivery at about 7d. per lb., ex wharf. Spot lots quoted 7½d. per lb. ex store.

SODA CAUSTIC.—76/77%, £18 per ton; 70/72%, £16 2s. 6d. per ton; broken, 60%, £17 2s. 6d. per ton; powdered, 98/99%, £21 7s. 6d. per ton, all carriage paid U.K. stations, spot delivery. Contracts, 20s. per ton less.

SODIUM ACETATE.—In little demand and price unchanged at about £23 7s. 6d. per ton ex store. Offered from the continent at £22 10s. per ton c.i.f. U.K. port.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton ex quay or station; M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 4d. per lb. delivered.

SODIUM CARBONATE.—Soda Crystals, £5 to £5 5s. per ton ex quay or station; powdered or pea quality, £1 7s. 6d. per ton more; alkali 58%, £8 12s. 3d. per ton ex quay or station.

SODIUM HYPOSULPHITE.—English material unchanged at £10 per ton ex station. Continental quoted £8 5s. per ton c.i.f. U.K. port. Spot lots available at about £9 10s. per ton ex store. Pea crystals of English manufacture quoted £13 15s. per ton ex station.

SODIUM NITRATE.—Ordinary quality quoted £13 17s. 6d. per ton ex store; 96/98% refined quality 7s. 6d. per ton extra.

SODIUM NITRITE 100%.—Nominally £25 per ton, but very little demand and could probably be obtained for less.

SODIUM PRUSSIAN, YELLOW.—In moderate demand and price unchanged at about 4½d. per lb. ex store. Offered for prompt shipment from the continent at 4d. per lb. c.i.f. U.K. port.

SODIUM SULPHATE, SALTCAKE.—Price for home consumption, £3 10s. per ton f.o.r. works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE.—English manufacturers quote: 60/65% solid, £15 per ton; broken, £1 per ton more; flake, £2 per ton more; crystals, 31/34%, £9 5s. per ton, carriage paid U.K. stations, minimum four ton lots, with a slight reduction for contracts over a period. Solid 60/62% offered from the continent at about £12 per ton c.i.f. U.K. port; 30/32% crystals at about £8 10s. per ton c.i.f. U.K. port.

SULPHUR.—Flowers, £9 10s. per ton; roll, £8 10s. per ton; rock, £8 7s. 6d. per ton; ground, £8 5s. per ton ex store. Prices nominal.

ZINC CHLORIDE.—96/98% of continental manufacture quoted £23 per ton c.i.f. U.K. port. English material for export on offer at about £25 to £26 per ton f.o.b. U.K. port.

ZINC SULPHATE.—Unchanged at £12 15s. per ton, ex store, spot delivery.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHYLAMINE.—Good home and export inquiries. Price 1s. 3d. per lb.

BENZALDEHYDE.—Some home inquiries. Price 2s. 3d. per lb. delivered.

BETA NAPHTHYLAMINE.—Steady demand. Price 4s. lb. delivered.
 NAPHTHIONATE OF SODA.—Small home inquiry. Price 2s. 3d. lb. 100% basis, carriage paid.
 PHENYL PERI ACID.—Some home and export inquiries. Price 6s. 3d. lb. 100% basis.
 PARA PHENYLENE DIAMINE.—Some home inquiry. Price 10s. lb. 100% basis, carriage paid.
 S ACID.—Some home inquiry. Price 12s. lb. 100% basis, carriage paid.
 SULPHANILIC ACID.—Some home inquiry. Price 9d. lb. 100% basis, carriage paid.

The Manchester Chemical Market

(FROM OUR OWN CORRESPONDENT.)

Manchester, January 8, 1925.

After a broken period of two weeks and a seasonal spell of quietness business on the chemical market here has settled down again, although buying operations this week have not been particularly brisk, either on home consumption account or for export. Chemical traders are, however, very hopeful of a moderately good volume of business coming along within the next week or two when the principal consuming industries get into stride. Except in a few instances prices keep very steady, with a distinct tendency here and there to firmness.

Heavy Chemicals

Values of soda crystals are unchanged at £5 5s. per ton, but only a moderate amount of trade is being done. Prussiate of soda meets with a fair inquiry and prices are well held, current quotations being round 4½d. per lb. Caustic soda is in quietly steady demand at from £15 12s. 6d. per ton for 60 per cent. material to £18 for 76-77 per cent., contract rates being £1 per ton more than these figures. Saltcake is dull but nominally without change from recent levels at about £3 10s. per ton. Sulphide of soda is still offering at about £14 per ton for 60-65 per cent. concentrated solid and £9 5s. to £9 10s. per ton for crystals, though actual business is of small dimensions. Glauber salts are quiet at about £3 10s. per ton. Hyposulphite of soda is in small demand and easy at £13 10s. to £13 15s. per ton for photographic crystals and round £9 10s. per ton for commercial quality. Alkali is steady and meets with a fairly good demand at £6 15s. per ton. Chlorate of soda is in quietly steady request and prices are firm at 2½d. per lb. Acetate of soda is offering at £21 10s. to £22 per ton, with the demand on a restricted scale. Bichromate of soda has been selling in small quantities, current values now being 4d. per lb. Bleaching powder is in rather quiet demand at £9 10s. per ton. Phosphate of soda is dull but values are not much changed from last report, current quotations being round £13 per ton. Bicarbonate of soda is attracting limited attention at about £10 10s. per ton.

Although not particularly active, both caustic potash and carbonate of potash are firm, 90 per cent. caustic being quoted here at between £30 and £31 per ton and carbonate at round £24. Chlorate of potash is in moderate request and values are steady at 2½d. per lb. Permanganate of potash is in quietly steady demand and prices are firm at 7d. to 8d. per lb., according to quality. A fair amount of interest is being shown in prussiate of potash which is firmly held at 7½d. to 7¾d. per lb. Bichromate of potash is offering at 5d. per lb., but the demand is on quiet lines.

Arsenic is both quiet and easy at about £37 per ton in Manchester for white powdered, Cornish makes. Sulphate of copper is steady and in moderate request at £24 10s. to £25 per ton, f.o.b. Commercial Epsom salts are selling rather slowly at the moment at £4 10s. to £4 15s. per ton, with magnesium sulphate, B.P. quality, quoted at about £6 10s. per ton. Nitrate of lead is quiet but firm at £42 10s. to £43 per ton. Acetate of lead values are very strong and the demand is fairly good; white is on offer at about £47 per ton and brown at £43. Acetate of lime is steady at £15 10s. per ton for grey material and round £11 per ton for brown.

Acids and Tar Products

Business in tartaric and citric acids is rather quiet, though there has been little change in values, tartaric offering at 11½d. to 1s. per lb. and citric at 1s. 4½d. Oxalic acid is weak at 3½d. per lb. Acetic acid is selling rather slowly at about £42 per ton for 80 per cent. commercial quality and £68 for glacial.

Pitch is quoted here at about £2 10s. per ton, with actual business rather quiet. Creosote oil is firm and in fair request at 6½d. per gallon. Carbolic acid is still quiet at 5½d. per lb. for crystals and 1s. 8d. per gallon for crude. Solvent naphtha continues firm at 1s. 6½d. per gallon. Naphthalene is quiet at £15 to £15 10s. per ton for refined and £5 for the low grades of crude. Cresylic acid is steady at 2s. to 2s. 1d. per gallon.

Major and Co., Ltd.

Brighter Prospects for Dye Business

The annual meeting of Major and Co., Ltd., was held in Hull on January 3. Mr. J. L. Major, the chairman, after referring to the satisfactory position of their subsidiary companies, stated that their dye business had been, as he had told the shareholders last year, a very great anxiety to them, and just when it seemed to be turning the corner they had had unexpected setbacks. The most recent weekly returns, however, showed that they were now on a small profit-earning basis, and the prospects look brighter than at any previous period. Their Sulcoates works, which were primarily for the distillation of tar and its products, were in a transition stage. For reasons of which the shareholders were aware, they decided to remove the distillation of tar almost entirely from that locality and had diverted that part of their business to another Yorkshire works under a profit-sharing scheme. For some time past they had been developing other processes at their Sulcoates works, but there were practical difficulties in carrying them on, on a sufficiently large scale, alongside tar distillation. The present position, although one of transition, they were moving, he hoped, towards a satisfactory solution.

Lubricating Oils in Oxidising Tests

At a meeting of the Institution of Petroleum Technologists, held on Tuesday at the Royal Society of Arts, Mr. J. B. Hoblyn, F.I.C., read a paper on "The Behaviour of Lubricating Oils under Oxidising Tests."

The problem, said the speaker, resolved itself into this—the engineer and the car owner desired a lubricant of suitable viscosity that gave easy starting in winter, freedom from asphaltic deposits in the crank-case, a minimum of "carbon" deposit on the pistons and no oiling of the plugs. There must be no sticking of pistons and valves. The nearer the oil came to maintaining its initial physical and chemical characteristics after use, the better it was for its purpose. Alteration in composition invariably led to the formation of asphaltic bodies, due to the action of the air and the high temperatures to which the oil was submitted, and when in this partially decomposed condition, the viscosity in the cold state was invariably much greater than that of the initial oil. Observation of a large number of oils pointed toward the fact that those that formed asphaltic bodies quickly were those possessing a low flash point, and in those cases the quick decomposition of the oil in the crankcase, producing a great amount of trouble in the starting of the engine on cold mornings, was accompanied by a partial distillation of the oil, some of the more volatile constituents being driven off and recondensing on the sparking plugs. Details of tests conducted with straight mineral oils were described and possible explanations offered as to their behaviour under certain circumstances.

Soil Examination and Analysis

THE subject of soil examination and chemical analysis involves the use of considerable scientific apparatus at every stage, and it is such apparatus which is described and illustrated in a special catalogue on soil examination produced by A. Gallenkamp and Co., Ltd., of 19-21, Sun Street, Finsbury Square, London. The principle of operation is in nearly every case described in detail, and the thoroughness of the catalogue makes it of particular interest to all concerned in agricultural research problems. The booklet covers all the modern appliances in use at the Rothamsted Experimental Stations, The Lawes Agricultural Trust, Harpenden. Apparatus for the determination of ammonia in the soil and of soil carbonates are mentioned.

Company News

BRITISH PLATINUM AND GOLD CORPORATION.—A final dividend of 6d. per share is announced in respect of the year ended July 31 last.

BROKEN HILL SOUTH.—A dividend is announced at the rate of 1s. 6d. and a bonus of 1s. per £1 share. The dividend a year ago was at the same rate but no bonus was paid.

ALLEN-LIVERSIDGE, LTD.—Particulars of the company were published in the press on Tuesday and public subscriptions invited for an issue of 150,000 6½ per cent. cumulative preference shares of £1 each.

WESTMINSTER BANK, LTD.—The directors have declared a final dividend of 10 per cent. in respect of the £20 shares, making 20 per cent. for the year; and a final dividend of 6½ per cent. on the £1 shares, making the maximum of 12½ per cent. for the year. The dividends will be payable, less income tax, on February 2.

CHAMPION AND SLEE, LTD.—The trading profit for the year ended September 30 last was £17,435, to which is added £2,855 brought in, making £20,290. After deducting directors' fees, depreciation of buildings, plant, etc., there remains £15,175. The directors recommend a dividend on the ordinary shares at the rate of 10 per cent. for the year, placing to benevolent fund £250, carrying forward £3,725.

GAS LIGHT AND COKE CO., LTD.—It is announced that this company is applying for Parliamentary powers to create £433,333 of three per cent. consolidated debenture stock for the purpose of converting the ten per cent. bonds of the company, amounting to £130,000. The conversion is proposed to take effect from January, 1926, when there will be issued to the holders of those bonds £333 6s. 8d. of the new debenture stock for each £100 of such bonds. Fractional parts of the new stock will be paid in cash.

ANGLO-CHILIAN NITRATE AND RAILWAY CO.—At a meeting held in London on January 2, the shareholders unanimously approved the agreement between the company and Guggenheim Bros., of New York, who undertake to form a company in the United States for the purpose of purchasing all the undertakings and effects of the Anglo-Chilian Co. Mr. William Hayne, the chairman, said the name of the new company would be the Anglo-Chilian Consolidated Nitrate Corporation, and all matters relating to that company and its by-laws would be submitted to their company. The capital of the new company would be £3,600,000 in 7 per cent. first mortgage debenture stock; \$12,500,000 in preference stock; and \$1,600,000 of common stock in ordinary shares of no denomination.

A Libel on the 'Phone

To the Editor of THE CHEMICAL AGE.

SIR,—Statements have been prominently made recently to the effect that our national telephone service is run at a loss to the State and the taxpayer. As this mis-statement cuts right at the root of the telephone's true position as an aid and economic ally both to business and to the State alike, will you kindly allow me to correct it?

The Treasury return of national revenue and expenditure for the nine months ended December 31 last shows an increase of £700,000 over the anticipated revenue from Post Office telephones. The latest Post Office accounts published (for the year ended March 31, 1923) show that the Post Office derived a gross revenue from telephones of close on £14,000,000 for the year, and that after paying all expenses (including depreciation and interest on capital invested) the net profit to the State was £939,000 for the year. The accounts for the year ended March 31, 1924, will show a net profit of over £1,000,000.

These figures show that the telephone service, in addition to its help to business, industry and social life alike, is also a revenue-raiser for the State.—I am, etc.,

H. E. POWELL-JONES,
Secretary of the
Telephone Development Association.

January 5.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to January 24, 1925.

"MACPRUF."

452,824. For chemical substances used in manufactures, photography, or philosophical research and anti-corrosives. Oswald McCardell and Co., Stretford Chemical Works, Low Moss Lane, Barton Road, Stretford, Manchester; chemical manufacturers. October 18, 1924.

"ALLIOPUR," "ALLISAT," "ALLISATIN," "LYOPOL," and "SEMIOPOL."

452,942, 452,943, 452,944, 452,946, and 452,947 respectively. For chemical substances prepared for use in medicine and pharmacy. Chemical Works, formerly Sandoz, also trading as Chemische Fabrik Vormalis Sandoz (a company incorporated according to the laws of Switzerland), 60, Fabrikstrasse, Basle, Switzerland; manufacturers. October 22, 1924. (Date claimed under International Convention, June 27, 1924.)

"STREETCO."

448,012. For mixtures of tar and bitumen for use in manufactures. Leslie Allan and Co., Ltd., Rainford Works, Rainford, Lancashire; refiners and distillers of petroleum and tar products. May 2, 1924. (To be Associated. Sect. 24.)

"COLDPHALT."

451,124. For bituminous emulsion for use in manufactures. Robert Macpherson and Wilfred Ernest Billingham, trading in co-partnership, 9, Marvels Lane, Grove Park, London, S.E.12; manufacturers. August 18, 1924.

"ALTITUDE."

453,320. For raw, or partly prepared, vegetable, animal and mineral substances used in manufactures, not included in other Classes. Class 4. The Pure Margarine Co., Ltd., 8, Victoria Street, Liverpool; margarine manufacturers. November 5, 1924.

Opposition to the Registration of the following Trade Marks can be lodged up to February 7, 1925.

"CORECO."

447,223. For raw or partly prepared vegetable, animal and mineral substances used in manufactures, not included in other classes. Class 4. The Coke Recovery Co., Ltd., 216 to 223, Abbey House, Victoria Street, London, S.W.1; manufacturers.

"KENTAN."

454,320. For raw or partly prepared vegetable, animal and mineral substances used in manufactures, not included in other classes. Class 4. The Kenya Extract Syndicate, Ltd., 24, George Square, Glasgow; manufacturers. December 6, 1924. (To be associated, Section 24.)

Voluntary Liquidation of Bristol Chemical Firm

A MEETING of the creditors of George Lockyer and Son, Ltd., animal charcoal manufacturers, of Bristol, was held on January 5 at Bristol, when Mr. H. C. Leonard, the liquidator, presided. The statement of affairs presented disclosed liabilities of £18,448 15s. 8d. and net assets £23,475 1s. 3d., a surplus of assets over liabilities of £5,026 5s. 7d. If satisfactorily disposed of as a going concern the assets, in the opinion of the directors, should realise substantially more.

It was stated that the company was incorporated in 1908. The company had gone into liquidation owing to the drop in the values of stock and losses sustained during the keen competition.

No resolutions were passed. The voluntary liquidation will therefore be continued with the present liquidator. The creditors include: British Glues and Chemicals, Ltd., £962; Barber and Garrett, £692; Bristol Refining Co., Ltd., £401; and United Alkali Co., Ltd., £392.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

DE MARTINO, L. J., 72, Mark Lane, London, E.C., chemical merchant. (C.C., 10/1/25.), £12 19s. 6d. August 26.

Receivership

SMITH AND CO., LTD. (R., 10/1/25.) H. M. Crabbe, of Portwall Lane, Bristol, was appointed Receiver and Manager on December 6, 1924, under powers contained in first mortgage debenture dated February 4, 1913.

Mortgages and Charges

[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]

ASHWORTH AND SMITH, LTD., Burrs, bleachers. (M., 10/1/25.) Registered December 24, 1st debentures, to bank; general charge. *£35,000. August 4, 1923.

DALTON CHEMICAL WORKS, LTD., Huddersfield. (M., 10/1/25.) Registered December 24, £16,000 debentures; general charge. *Nil. March 12, 1924.

GILCOUR OIL AND DRUG CO., LTD., Halifax. (M., 10/1/25.) Registered December 18, £150 debentures, to W. Clarkson, Springwell House, Holbeck Bridge, Leeds, carting agent; general charge.

HEPPELS, LTD., London, E.C., chemists. (M., 10/1/25.) Registered December 23, £85,000 deed of security and mortgage, to F. J. M. Pyne, and another, 15, Lombard Street, E.C., bank managers; charged on properties in Knightsbridge, etc. also general charge.

TAYLORS' DRUG CO., LTD., Leeds. (M., 10/1/25.) Registered December 29, £650 mortgage, to Mrs. J. A. Whitham, Morleigh, The Drive, Roundhay, Leeds, and another; charged on property at Blackhills Road, Horden Colliery. *£111,744 os. 11d. September 12, 1924.

Companies Winding Up Voluntarily

NATAL AMMONIUM, LTD. (C.W.U.V., 10/1/25.) R. B. Petre, Chartered Accountant, 11, Ironmonger Lane, London, appointed liquidator, December 30. Meeting of creditors at liquidator's office on Thursday, January 15, 1925, at 2.30 p.m.

MAHE SYNDICATE, LTD. (C.W.U.V., 10/1/25.) By special resolution, December 31st.

Winding Up Petition

ROLSTON AND ABBOTT LTD. (W.U.P., 10/1/25.) A petition for winding up has been presented, and is to be heard at the Courthouse, Quay Street, Manchester, on Tuesday, January 20, at 10.15 a.m.

Order Made on Application for Discharge

LAMBERT, Robert Morrison, 10, Great St. Helens, London, E.C., drug merchant. (O.M.A.D., 10/1/25.) Date of Order, December 5, 1924. Discharge suspended for two years and six months until June 5, 1927.

Partnership Dissolved

COOPER AND JACOB (Frederick William COOPER and Herbert William JACOB), chemists and druggists, Swaffham, by mutual consent as from December 30, 1924. Debts received and paid by F. W. Cooper, who continues the business.

New Companies Registered

BONNITE MEDICAL CARBON CO., LTD., 141, Moorgate, London, E.C.2. Manufacturers of and dealers in carbons of all kinds, importers and exporters of and dealers in sugar, saccharine, molasses, etc. Nominal capital, £6,000 in £1 shares.

JONES AND CO. (METHYLATORS), LTD., Regent Wharf, Copperfield Road, Mile End, London. Methylators, chemists, druggists, distillers, chemical manufacturers, etc. Nominal capital, £50,000 in £1 shares.

SEYMOUR SMITH AND CO., LTD., 6, Charlotte Street, Southampton. To carry on the business of lubricating oil, grease and disinfectant merchants, dealers in polish, etc. Nominal capital, £1,500 in £1 shares.

SHAW AND CO., LTD. Soapmakers, perfumers, seed crushers, varnish makers, etc. Nominal capital, £2,000 in £1 shares. A subscriber: A. H. Burgess, 1, Rialto Street, South Circular Road, Dublin.

STANDARD TABLET CO., LTD. Manufacturing, wholesale, retail, consulting and analytical chemists and druggists; soap manufacturers, smelters and refiners of ores; drug grinders, etc. Nominal capital, £100 in £1 shares. Solicitors: Durrant, Cooper and Hambling, 70 and 71, Gracechurch Street, London, E.C.3.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CEMENT.—Tenders are invited for supply of 5,000 to 6,000 tons of British-made cement of British standard specification, for Hampshire County Council. Tenders to County Surveyor, Winchester, by January 21.

FERRIC SULPHATE.—Tenders for the supply of ferric sulphate or copperas, lime, cement, and tar, are invited by Chiswick Town Council. Tenders to Town Clerk by January 19.

OILS, SHELLAC, ETC.—An agent in Copenhagen desires to secure the representation of British manufacturers and exporters of vegetable oils, shellac, gums and zinc oxide. (Reference, No. 10.)

LUBRICANTS, ETC.—An established agent in Oran, Algeria, desires to represent British firms exporting lubricants, paraffin, petrol, edible oils, and drugs. (Reference 48.)

Tariff Changes

AUSTRALIA.—Notices revoke the dumping duties imposed on potassium permanganate crystals B.P. originated in or exported from Germany, and on permanganate of potash B.P. originated in or exported from Czechoslovakia, respectively.

FRANCE.—Alterations in the classification of articles include:—Synthetic tanning extracts, as "chemical products, not specified" (No. 0381); composition for cleaning or polishing metals, with a base of silicate of soda, caustic soda, and other products, as "chemical products not specially mentioned" (No. 0381); freezing mixture with a base of sal ammoniac and nitrate of potash and similar products, as "chemical products not specially mentioned" (No. 0381); aluminium in granules, same regime as "cast aluminium" (No. 203).

Pulverised Fuel for Birmingham

BIRMINGHAM Corporation Electric Supply Committee has been considering the question of the emission of grit and the resultant nuisance in the vicinity of the generating stations. At a recent meeting it was stated that orders had been given for grit catching apparatus and the department had adopted the use of a good class coal. The electrical engineer gave details of the working of pulverised fuel in America, and the department was now feeding one set of boilers with this type of fuel. If the experiment proved satisfactory it was intended to extend the principle as the chief method of combating the grit nuisance.

